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ORIGINAL ARTICLES.

FURTHER NOTES ON THE FUNCTION OF THE PARATHYROID GLANDS.

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IN a previous paper[1] one of us reviewed some of the recent work on the physiology of the parathyroid glands and recorded a number of experiments carried out with the aim of defining in some way those functions. Since there still remains much obscurity about this subject we venture to make known the result of a few more experiments along similar lines.

In the paper cited, experiments were described which tended to show that the tetany resulting from extirpation of the parathyroids is probably not an affection of the muscles themselves nor of the peripheral nerves, but rather of the higher centers of the nervous system, for section of the spinal cord practically abolishes tetany on the portion of the body thus paralyzed. After the publication of these results the paper of Lanz[2] first came to our notice in which he describes similar experiments and further the elimination by extirpation of the motor areas of the cerebral cortex in which even an increased tetany of the paralyzed side was observed. We have produced this condition once after several attempts, extirpating the motor area on one side only and after the wound had healed, or nearly healed, extirpating the parathyroid glands. The dog succumbed to the typical tetany in which there was no especial inequality of the convulsive movements to be noted on the two sides. We can therefore agree with Lanz, or at least say, that this is an affection of those cells which continue the function of the muscles which are cut off from their original direct cortical connections. Exactly where these cells are it is difficult to say.

In that paper there were also notes of some experiments which showed clearly, as the papers of Albertoni and Tizzoni, Fano and Zanda and others had previously shown, that the tetany could be temporarily relieved by bleeding and injection of salt solution into the veins. This apparently demonstrated the presence of a circulating toxin which was the cause of the nervous disturbance. At that time it was not found possible to confirm this idea by producing tetany by the transfusion of the blood of a dog in tetany into the veins of another dog, either normal or parathyroidectomized. Two cases were described there, in neither of which any symptoms appeared. Several Italian writers have, however, described positive results in such an experiment, and on that account it was again attempted. The experiments hardly lend themselves to tabulation so that they will be recorded briefly, in order as copied from my notes:

Dog 119.—One parathyroid removed from each side; dog remained well. On May 3 at 4.30 P.M., the dog was etherized and the blood of dog 121 transfused directly from the aorta into the jugular vein while dog 121 was in violent tetany. At 5.30 P.M., on recovery from ether, the dog is trembling, but not in tetany; 7 P.M., and no definite twitching; 12 midnight, dog seems normal, no twitching; May 4, dog is quite well.

Dog 127.—Small puppy—May 9, 5 P.M., right thyroid with parathyroids removed; two parathyroids removed from left side. Dog bled 100 c.c. from jugular vein. Canula from aorta of dog 124, then in tetany, introduced into proximal end and blood allowed to run until dog 124 died of anemia. Animals etherized. 8 P.M., dog recovered from ether and no tetany—seems well; 1.30 A.M., dog asleep, no twitching.

Dog 135.—Partial parathyroidectomy; dog bled 80 c.c. and 90 c.c. of serum of blood from dog in tetany run into jugular vein. No evidence of tetany. Dog died of pneumonia.

Dog 145.—Two parathyroids removed from right side, thyroids with parathyroids from left, January 14. (From the further history it seems that some parathyroid tissue must have remained.) On February 1 dog seemed quite well. Etherized, bled 50 c.c. and 200 c.c. of blood from dog 147, then in tetany, allowed to run into the jugular vein from a funnel after straining through four-ply gauze. On recovery from ether the dog had violent spasmodic twitchings, trismus, etc., which were confused by the incoordination and shivering due to ether. We thought at the time that the dog was in tetany, but in the course of an hour this wore off and it could then only be said that the dog was shivering. Next day (February 2) he received, without anesthetic,[1] 80 c.c. of the same blood which had stood overnight. Some twitching appeared but soon passed off. Dog was well next day and remained well until March 10, when, almost two months after the first operation, he had an attack of tetany with respiratory distress, which however soon passed off. Dog

[1] W. G. MacCallum, MEDICAL NEWS, Oct. 31, 1903.
[2] O. Lanz. Volkmann's klinische Vorträge, 1894.

[1] The operation of introducing the blood is very slight and the animals make no objection to it; therefore, on account of the disturbing effects of the anesthetic, which are obvious in the decriptions given by other writers, the subsequent transfusions were done without anesthetic.

was then well until March 26, when he was found in another attack of tetany with violent respiratory distress, rigidity of the legs, etc. Two days later (March 28) dog seemed quite well; was bled from jugular 100 c.c. and received at 1 P.M. 150 c.c. of blood from dog 157, then in violent tetany. At 2 P.M., slight shivering. At 3 P.M., distinct shivering; dog lies quietly, with scattered slight twitchings; nothing more definite. At 6 P.M., dog has very slight twitching, which is declared by the bystanding dog fanciers to be merely shivering. No fibrillary tremor of tongue; dog lies quiet. Next day (March 29) he seemed normal enough; dog died April 6 much emaciated. No lesion found to account for death.

Dog 151.—February 21, four parathyroids removed; there was probably not a complete parathyroidectomy. March 6, dog seems quite well; wound healed. At 5.30 P.M., bled 100 c.c. from the jugular vein and received 300 c.c of blood from dog 153 bled during tetany. The blood was defibrinated and introduced into the proximal part of the jugular vein, a little at a time, during about forty-five minutes. Some slight tremor of limbs and head appeared during operation, readily felt over the legs. 6.30 P.M., after dog was released, nothing definite could be made out; tremor, if present, was remarkably slight and easily confused with shivering. 8.30 P.M., dog observed with care under strong light. There is, while he walks about, no evidence of any disturbance unless it be a general lassitude and tendency to lie down. When allowed to be still the hind legs and pectoral muscle do twitch distinctly, even when he is lying on a warm wooden surface. 11 P.M., same conditions; nothing observed when walking, slightest tremor on remaining quiet. Next day the dog seemed quite normal. March 8, dog has, at 9.30 A.M., slight definite tetany. Next day (March 9) dog was quite normal, and from then to April 17 the condition remained the same. On April 17, at 12.30 P.M., dog was bled 100 c.c. from jugular vein and received 150 c.c. of blood from dog 152 killed in tetany. Dog runs about after operation; slight shivering, no other disturbance; no definite tetany; 1.30 P.M., dog shivering quite violently, but no definite tetany; 3.45 P.M., laid in sun on a warm table for a while. It is so warm there that he can hardly be shivering. Dog lies perfectly quiet, while slight but distinct twitchings can be both seen and felt. The hair over the twitching area makes definite excursions. This is most marked over shoulders and thighs and respiration not affected. At 10.30 P.M., twitching had stopped; April 18, normal.

Dog 186.—December 23, complete parathyroidectomy; December 24, dog in violent tetany at 4 P.M., with rigidity of limbs, dyspnea, tachypnea, etc.; 4.30 P.M., bled about 100 c.c. or a little more from jugular vein. By this time the tetany had become reduced to a play of muscular twitchings over the body, and a distinctly rapid but not violently labored respiration. 100 c.c. salt solution introduced into the jugular vein. Within four or five minutes the respiration became normal and the tetany was reduced to a scarcely perceptible twitching of a few muscle-bundles, the upper eyelids, which had been much retracted, became normal, and dog was allowed to run about. At 5.20 P.M., or about half an hour after the previous bleeding and infusion had been completed, the blood which had been defibrinated was returned to the veins. No increase in the very slight twitchings. 6.30 P.M., dog in same condition. Observed again at 7.30 P.M. and at 12.30 A.M., but no return to the violent tetany could be observed. December 25, dog shows no tetany and seems to be in good condition. December 28, dog still without evident tetany, runs about. Tetany did not reappear, and by January 10 the wound had healed and the dog seemed pretty well. The thyroids were then removed and two bits of parathyroid tissue were discovered embedded in them. This dog had, therefore, developed tetany upon the incomplete removal of the parathyroids.

It is apparent from these cases that no very intense tetany can be produced by the intravenous injection of blood taken from a dog during tetany, even when the subject of the experiment is an animal deprived of most of its parathyroid tissue and subject to occasional attacks of tetany, as in dog 145. In the last experiment (dog 186) the dog was subjected to this test practically during the attack of tetany, but the introduction of the salt solution to produce the non-tetanic condition makes it no longer possible to expect the pure effects of the introduction of such toxic blood in a dog known to be disposed to tetany, for the experiment finally amounts to the simple introduction of 100 c.c. of salt solution into the veins of a dog in tetany which would doubtless stop the tetany. Two attempts were made to cause the disappearance of tetany by the mere removal of blood and its reappearance by the reintroduction of the blood, but unsucessfully.

Dog 179.—Medium-sized female. Thyroids and parathyroids extirpated January 16; dog found in violent tetany January 19 with marked respiratory disturbances, and from one period of apnea was restored only by vigorous artificial respiration. Bled about 150 c.c. from the carotid, after which the respiration remained irregular, being rapid for perhaps twenty seconds, returning then to the normal rate. The rigidity and twitchings were somewhat improved but the dog was still pretty stiff. In the course of further bleeding, in the attempt to cause the disappearance of the tetany, the tremors did seem to disappear but the dog was moribund and died.

Dog 192.—Young dog. Parathyroids removed February 13; violent tetany February 14; bled 175 c.c. and 150 c.c. salt solution intro-

duced into veins. Rigidity and tremors disappeared within twenty minutes. Half an hour later the defibrinated blood was reintroduced into the veins, causing marked congestion. The dog continued to lie quietly on the floor, apparently quite comfortable. From February 14 to February 21 he seemed fairly well, although rather apathetic—no tetany. On February 21 the dog again developed violent tetany with respiratory distress. Attempted to bleed and reintroduce the blood without salt solution, but the animal succumbed after the removal of about 125 c.c. of blood, while still showing definite tetany.

It is doubtful whether one could place any reliance upon observations made upon an animal bled to such an extent, at any rate, for the characteristic respiratory symptoms are at once modified by the anemia, and the great weakness resulting from the anemia of the muscles has also its effect upon the tetany. The disappearance of tetany on the introduction of a small quantity of salt solution and, especially the length of time during which the dog will remain apparently well after such treatment before the tetany reappears, offers some difficulties for explanation.

Apparently the quantity of toxin in the circulatory blood is, if one may judge from these experiments, extremely small and is probably rapidly bound up with the cells of the nervous system when the parathyroids are not present to neutralize it, so that the continued influx of a minute quantity serves to bring about finally the violent symptoms. It was thought that this might be warded off even after tetany had begun by the use of emulsions of fresh dog's brain substance which, on being injected into the peritoneum, would afford an excess of suitable material for the linking of the toxic groups in the blood. This was, in fact, carried out in three cases, as follows:

Dog 148.—Two parathyroids (right) one large parathyroid and whole thyroid lobe (left) removed on February 2. On February 4, at 9.20 A.M., dog showed slight twitching, which gradually increased until 4.30 P.M. The emulsified brain of a normal dog mixed with salt solution injected into the peritoneum. At 8 P.M., tetany was milder, but at 10 P.M. very violent. Next day (February 5) dog seemed quite well all day —no twitching whatever, but somewhat somnolent. The third day, February 6, tetany reappeared and continued all day, being very violent in the afternoon. At 2.30 P.M., the brain of another dog was emulsified and injected into the peritoneum. The fourth day (February 7) there was moderate tetany and for six days following the dog apparently was in fairly good condition, becoming, however, gradually emaciated. Death on February 13.

Dog 150.—Complete parathyroidectomy; after four days violent tetany. Brain emulsion injected into peritoneum. Dog seemed to recover and stood up and walked about. Found dead next day, however.

Dog 154.—March 5, complete parathyroidectomy; March 8, beginning tetany—rather violent toward noon. Emulsion of brain injected into peritoneum. Dog recovered from tetany but sank into an apathetic condition, which lasted five days and ended in death.

Whether the action of the brain emulsion was such as is suggested above, or merely such as the injection of so much salt solution, or, still more probable, of so much emulsion of any other organ from a normal dog or of blood, it is hard to say. It is, indeed, curious to observe how slight a thing may suffice to stop the tetany. A whiff of ether will cause a complete cessation of tetany, usually also with cessation of the respiration, while the heart goes on for a time. The animal may be restored by artificial respiration, but unless this is prompt he dies. The tetany may reappear at once or it may remain absent for some time; particularly is this true as it seems, if any operation is performed on a dog while in tetany. When, however, the tetany is very severe these things affect it but little. Various sedatives, such as morphine, when given in rather large doses, will cut short the spasms, and when somnolent from the effects of such a drug the dog shows spasmodic movements only when frightened or on exertion.

Mention was made in the previous paper of the work of Verstraeten and Van der Linden, in which they attempted to show that, when fed on milk alone or on bread and water, parathyroidectomized dogs were less liable to violent attacks of tetany. They thought that in this way they had in some degree explained the supposed immunity of the herbivora from this condition of tetany. Although a case was there quoted which seemed to support their statement —a dog parathyroidectomized and fed on bread and water, which lived for twenty days without tetany—it seems, from more recent experiments, that the nature of the food has but little influence upon the course of the tetany.

Dog 144.—January 12. Complete parathyroidectomy; exclusively milk diet; January 14, distinct tetany, rigidity of legs, etc. Used after this for other experiments.

Dog 146.—Fed for two days on milk alone and this diet continued throughout. January 16, complete parathyroidectomy, one thyroid lobe being also removed. January 20, dog in violent tetany; given morphine and became somnolent. Tetany ceased; January 21, no tetany. January 22, violent tetany and death.

Dog 150.—February 9, given no food at all; February 10, given no food. Epsom salts produced purgation; intestines apparently cleaned out; February 11, complete parathyroidectomy; still given no food; February 12, dog seems well, no tetany; February 13, dog found in violent tetany this morning. Since February 9 has had nothing whatever to eat.

From these cases it appears that even when the intestinal tract is quite empty before and after the operation, tetany will develop with the maximum intensity; and the suspicion enters one's mind that possibly the explantion of the freedom from tetany in Verstraeten and Van der Linden's cases was, as it is in so many other negative results in connection with the tetany of parathyroidectomy, due to incomplete extirpation of the parathyroids.

Many writers on the subject of the symptoms resulting from extirpation of the parathyroids state that the animals may die either of the well-known tetany, or they may sink into an apathetic condition, becoming daily more and more emaciated, and perish after a number of days in an extraordinary cachectic condition. The question enters one's mind as to whether this is the direct result of the complete extirpation of the parathyroid, or possibly due to infection of the wound, or to modification of the usual tetany by the leaving behind of some minute portion of parathyroid tissue. It is to be noted that this condition of protracted poisoning may ensue when, after tetany is once well developed, its course is interfered with by washing out of the blood, etc. Often, too, when the symptoms of tetany are particularly mild and consist only in slight twitching, the progressive emaciation may be associated and in time lead to the death of the animal. This atypical course of the symptoms of parathyroidectomy is, however, not especially common, and in the majority of cases in which the parathyroidectomy is performed tetany appears frankly. Thus of our 39 cases, which were not known to be partial extirpation only of the parathyroids, tetany developed a well-marked form in 35. In all but two cases there was at some time twitching of the muscles, and possibly this was true also of those two and would have been recorded had they been more minutely watched. The fact remains, however, that in a certain small number of cases the tetany does not develop with its usual rapidly fatal result, but is overshadowed by the gradually increasing stuporous and cachectic condition, appearing in the course of this only as a moderate twitching of the muscles.

The cases of this sort which occurred in our series are noted below.

Further, there were at least two cases, such as 120 and 186, in which the repeated bleeding and infusion of salt solution warded off or relieved the tetany, which would otherwise have been quickly fatal, and allowed of the development of the slower process of poisoning. In some of these cases, such as 144, 171, and possibly also 169, the infection of the wound and the development of abscesses may have played an important part in the production of the symptoms; in others, however, such infections as are evidenced by an intense coryza, conjunctivitis and scattered skin pustules seem to be the result of the lowered resistance rather than the cause of the condition. The stupor and cachexia seem not to depend upon the coincident removal of the thyroid which was carried out in some cases, for it was quite as marked in the cases of simple parathyroidectomy. It is interesting that in at least one case (169) the parathyroidectomy was certainly incomplete, and there seems to be a good deal in favor of the idea that the absence of a tetany sufficiently violent to produce death at once, thus allowing the development of symptoms from the more general poisoning of the tissues, is due to the existence after the operation of some trace of parathyroid tissue—just sufficient to ward off the violent tetany, while not sufficient to maintain health.[1] The same explanation will apply perfectly to the results of washing out the blood at the beginning of the violent tetany.

Dog.	Duration of Exp.	Organ extirpated.	Results.
110	9 days	Thyroid and parathyroids	Slight tetany, conjunctivitis, gradual emaciation and weakening.
125	20 days	Parathyroids	No tetany, emaciation (bread and water diet).
132	16 days	Parathyroids and one lobe of thyroid	No tetany, gradual emaciation.
144	11 days	Parathyroids	Tetany repeatedly relieved by morphine, multiple abscesses, emaciation, apathy.
160	7 days	Parathyroids and thyroids	Conjunctivitis and coryza, emaciation, cachexia.
167	5 days	Parathyroids	Tetany, thyroidectomy; tetany continued, cachexia and death.
169	6 days	Partial parathyroidectomy	Gradual cachexia, tetany, slight infection, died at night.
171	10 days	Parathyroids	Gradually developing stupor, tetany on sixth and seventh days, extensive infection of wound, etc.

We have made several attempts to control the course of the tetany following parathyroidectomy by injection of parathyroid material. In the literature this has been attempted with varying results. Edmunds[2] fed a large quantity of parathyroid material to an animal in tetany without result. Vassale[3] obtained good results from the emulsion of thyroids in which the parathyroids were included, and Gley[4] confirmed these.

1 Since this was written further examination of the tissues of dog 186, removed at a second operation, showed that while the tetany had been quite intense there were still two portions of parathyroid tissue left imbedded in the thyroid.

2 Edmunds. Brit. Medical Journal, 1901.

3 Vassale. Rev. Sper. de Frematria, 1890.

4 Gley. C. R. d. la Soc. de Biol., 1891.

Lusena[1] describes several cases in which he prolonged life by transplanting parathyroids or by injecting parathyroid material subcutaneously. His results are astonishingly good as compared with ours, for, by the subcutaneous injection of parathyroid emulsion for eight days and then the subcutaneous transplantation of one parathyroid every fifteen days, the dog was kept alive for more than four months. Others were kept alive for over two months by the implantation of parathyroids. Lusena says nothing of the anatomical condition of these implanted parathyroids after the death of the animal, but on account of their usual rapid degeneration it seems remarkable that they should have been so effective in preventing tetany.

For our experiments see table on this page:

Of these dogs the last two were most interesting, and the clinical history of one at least may be given in greater detail.

Dog 170.—November 5. Parathyroidectomy attempted; only two of the parathyroids found; dog showed no symptoms after this; November 25, wound quite healed. Again operated upon and both thyroid lobes removed. On November 28, dog was found in violent tetany, with the usual respiratory disturbances, etc. The right jugular vein was opened and an emulsion of parathyroid of dogs (parathyroids from twenty dogs ground up in 2½ c.c. of sterile bouillon and strained through gauze) injected into the vein at 11 A.M. At 5 P.M., respiration was quiet and there are only slight twitchings observed. He walks stiffly, however, lifting his hind feet far too high in entering the cage. November 28, 8 A.M., no tetany; runs about well; slightly apathetic and stupid. At 1.45 P.M., tetany has begun again; 5.45 P.M., dog in violent dyspnea, very rigid, tetany very marked. Emulsion of parathyroid from thirty-seven dogs injected into jugular vein (the parathyroid material was obtained from the slaughter-house, where stray dogs are killed in great numbers); 7.30 P.M., dog still having severe dyspnea of Cheyne-Stokes character, lies on floor; tetany is fairly violent. November 30, 8 A.M., dog seems greatly improved and is able to walk about; no twitching; respiration quiet; runs about and eats. December 1, condition still good. December 2 and 3, slight twitching about temple. December 3, emulsion of parathyroid from twenty-two dogs injected into peritoneum. December 4, 5 and 6, dog well enough. December 7, slight twitching about head; 11 A.M., parathyroids of eighteen dogs emulsified and injected into peritoneum; 3 P.M., dyspnea and general tetany; respiration very stridulent. December 8, 8 to 10 A.M., dog in violent tetany, lying on floor rigid; inspiration difficult and squeaky; vomiting. Emulsion of parathyroid of cow in sterile water injected into inferior hypogastric vein. It is difficult to estimate the amount (8 c.c. of a cloudy emulsion made from about .25 grm. of dried parathyroid, probably fifteen dried parathyroids of cow). December 9, remarkable improvement; runs about and is playful; December 10, twitchings in muscles of neck; given emulsion of fresh dog's parathyroids (about fifteen dogs) intravenously; December 11, dog seems well, no tetany; December 12, dog seems quite well; occasional slight twitching about temples. December 13, 8.30 A.M., well-marked tetany and dyspnea, not, however, of maximum violence; no parathyroid material was obtainable and the dog died at 3 P.M. Autopsy revealed no infection of wounds; organs in general, normal. Several accessory thyroids of small size in tracheal region and aortic arch.

Dog.	Operation.	Tetany.	Treatment.	Result,
113	April 10	April 15	April 15, three parathyroids of cow intraperitonally.	Twitching continued. Emaciation, apathy; lived five days.
146	Jan. 16.	Jan. 20	January 20, subcutaneous injection of emulsion of beef parathyroid, also of morphine.	January 21, recovered from tetany. January 22, violent tetany and death.
170	Nov. 25 Thyroparathyroidectomy.	Nov. 28	Various injections intravenously of emulsion of parathyroids.	Temporary relief with each injection.
178	Nov. 22	Nov. 26	One intravenous injection of parathyroid emulsion.	Recovery from attack of tetany; death five days later from infection.

Evidently after complete parathyroidectomy the life of the animal can be maintained only with the greatest difficulty by the injection intravenously of relatively large quantities of parathyroid material. Even this, as shown in the case just related, was insufficient to prevent the repeated reappearance of the tetany, so that it seems probable that the cases in which the symptoms are relieved for a long time by insignificant doses given subcutaneously, are instances in which the extirpation of the parathyroids was incomplete. From this it follows that the treatment of the tetany which has been seen to follow extirpation of the thyroid (with the parathyroids) in human beings, by the used of parathyroid extracts, would probably be almost impracticable, although the use of such material might perhaps be beneficial in

[1] Lusena. Fisiopatologia dell' Apparecchio tiro-paratiroideo, Firenze, 1899.

those cases in which symptoms are due to a less intense parathyroid insufficiency. The condition is different from that found after extirpation of the thyroid alone, in that the symptoms appear so rapidly and are so quickly fatal that there is no time to apply the usual methods of administration of the organ extracts, which are so effective in the case of myxedema and in which possibly a cumulative or continuous action is produced. The emulsion or extract of parathyroid, to produce its maximum effect, must be introduced into the veins in considerable quantity.[1] After this process the result may be astonishing, as illustrated by our notes on dog 178:

Dog 178.—November 26, 4.30 P.M., dog rigid and tetanic; respiration 60, labored; emulsion of parathyroids from sixteen dogs injected into jugular vein. Dog stopped breathing several times, but was resuscitated; seemed practically moribund. 5.50 P.M., dog lying stretched on floor, limbs very stiff; Cheyne-Stokes respiration; 8.30 P.M., still lying stiffly on side; tetanic spasms in muscles; breathing regular. November 27, 9.30 A.M., dog is able to stand and walk about; respiration perfectly quiet. No signs of rigidity or tetanic spasm.

Dog.	Date of operation.	Interval before development of tetany in days.	Date of first tetany.	Duration of tetany in days.	Date of death.	Nature of symptoms.
110	April 2,	2	April 4,	6	April 10,	slight tetany.
120	April 25, one lobe. April 29, remaining lobe.	2	May 1,	8	May 9	violent tetany, cured temporarily by bleeding and infusion.
152	February 27, 3 parathyroids removed. March 18, one thyroid removed. April 9, second thyroid removed.	8	April 17,		April 17,	violent tetany
160	Oct. 20,				October 27,	emaciation and cachexia.
162	Oct. 21,	8	October 29,	6	November 4,	slight tetany.
170	November 5, 3 parathyroids removed. November 25, thyroids removed.	3	November 28,	15	December 13,	violent tetany, parathyroid treatment.
166	January 10,				January 22,	abortion, emaciation, no tetany.
173	January 10,				January 12,	no symptoms observed.
179	January 16,	3	January 19,		January 19,	violent tetany.
185	January 17,			11	January 28,	slight tetany; apathy.
186	January 10,				February 1,	emaciation, apathy, no tetany except on one day, then slight.
187	January 14,				January 23	slight tetany; apathy.

For a time Gley and others held the belief that the parathyroids are merely undeveloped bits of thyroid tissue which, if the thyroids be destroyed, can develop into thyroid tissue. This idea, however, has been disproved by anatomical, embryological and experimental work, and the glands recognized as distinct organs. Certain authors, however, hold that there is a functional relation between thyroid and parathyroid. Moussu, basing his results on changes in the parathyroids after extirpation of the thyroids in rabbits, put forward this idea and disagreed with Gley's theory. He found that after extirpation of the thyroids the parathyroids enlarged and became more vascular. This, as we now see, was probably an attempt at compensatory hypertrophy, on account of the removal of the other two parathyroids, which lie in or upon the thyroids, and not more directly related to the removal of the thyroid. Gley showed that there is iodine in the parathyroids, and concluded that this established a functional relation between them. Vassale and Generali, and, later, Lusena, determined that the effects of parathyroidectomy came on more suddenly and were more violent than those of thyroparathyroidectomy, which began slowly and usually allowed the animal a longer lease of life. Indeed, Lusena claimed to have stopped the progress of the tetany of parathyroidectomy by excising the thyroid during the convulsion.

Vassale and Generali explain this as follows: The parathyroids ordinarily neutralize poisons produced in the course of metabolism. Metabolism is decreased by thyroidectomy, and therefore the task of the parathyroids will be less and the disturbances in a parathyroidectomized animal less. Lusena, on the other hand, regards the thyroid as a gland in which toxic substances are collected from the blood, and, under the necessary influence of the parathyroid glands, converted into the innocuous colloid material. On removing the parathyroid glands this conversion ceases, and after a few days the poison

[1] In order to avoid the confusing effect of the injection of large quantities of fluid which of itself might temporarily relieve the tetany, the parathyroid emulsion was made in a minimal quantity of salt solution, usually 2 to 3 c.c. only.

may be returned to the blood and the tetany thus come on suddenly. On the other hand, if the thyroid and parathyroid are removed altogether, the poison begins at once to be present in the blood and the symptoms therefore appear gradually, but from the beginning. The beneficial effects of the removal of the thyroid during the tetany are evidently to be explained on the ground that stored-up unchanged toxic material, which might be returned to the blood, are thereby removed. That such an accumulation of toxic materials in the blood does not occur in thyroidectomy when the parathyroids are left, is explained by the presence of accessory thyroids and of the glandular part of the hypophysis which is assumed to have a similar function.

There are many weak points in this theory, which is based on several assumptions which are hardly justified by the facts at our disposal. For example, we have no proof whatever that the thyroid has any such antitoxic or neutralizing action in the production of colloid. We cannot produce tetany by the complete extirpation of the thyroid as long as the parathyroids are left, and it seems that to refer this to the action of the infinitesimal and inconstant accessory thyroids, and to the hypophysis of which we know nothing, is an evasion. The tetany is at once cured by the introduction of pure parathyroid emulsion or extract into the vessel, even when the thyroids have been extirpated.

It seems more probable, therefore, that these glands are much more independent in function than Lusena would have us believe. Our series of cases of extirpation of the thyroid together with the parathyroids is small, and the results complicated by further experiments upon the same dogs. See preceding page.

The course of events in dogs 120, 152, 170 and 179 could not have been distinguished from that in the pure parathyroidectomy, the longer duration of life in some after the beginning of tetany being entirely due to the treatment. In the other cases tetany was slight

Author.	Case.	Interval after operation before beginning of symptoms.	Duration of symptoms.	Severity and nature of symptoms.
Ughetti and de Mattei	10 dogs	2 to 3 days	4 days—1 case 6 days—3 cases 12 days—3 cases 15 days—3 cases	cachexia, dyspnea and tetany.
Albertoni and Tizzoni	1 dog	3 days	4 days (killed)	severe tetany.
	2 dogs	2 days	several days (killed)	severe tetany.
	3 dogs	3 days	15 days	cachexia dyspnea and tetany.
Gley	1 dog	43 hours	11 days	
	1 dog	41 hours	6 days	
	1 dog	22 hours	2 days	
	1 dog	42 hours	3 days	
	1 dog	64 hours	(killed)	
	1 dog	61 hours	74 hours	
	1 dog	66 hours	86 hours	
	1 dog	23 hours	9 days	
	1 dog	30 hours	50 hours	
	1 dog	41 hours	7 days	
Masoin	1 dog	18 hours	4 days	
	1 dog	24 hours	11 days	
Verstraeten and Vanderlinden	1 dog	1 day	5 days	
	1 dog	2 days	9 days	
	1 dog	3 days	3 months	
Regnier and Paulesco	1 dog	1 day	1 day (killed)	
	1 dog	1 day	3 months	
Jouty	1 dog	2 days	5 days	violent tetany.
	1 dog	6 days	7 days	violent tetany.
	1 dog	3 days	1 day	violent tetany.
	1 dog	2 days	1 day	violent tetany.
Lusena	1 dog	4 days	11 days	tremors and shaking; coma.
	1 dog	3 days	10 days	
	1 dog	3 days	5 days	
	1 dog	4 days	12 days	
	1 dog	4 days	7 days	
	1 dog	5 days	19 days	
	1 dog	3 days	7 days	
	1 dog	4 days	16 days	
	1 dog	5 days	17 days	
	1 dog	3 days	11 days	
	1 dog	2 days	12 days	
	1 dog	2 days	13 days	
	1 dog	4 days	14 days	
	1 dog	4 days	14 days	tetany at second day, accessory thyroid.
	1 dog	2 days	2½ days	

or absent and the course of the illness somewhat prolonged. For comparison with these, I may quote from the literature such cases as have been observed after this operation of thyroparathyroidectomy. See table on preceding page.

From this list of cases it is seen that symptoms, sometimes those of violent or moderate tetany, sometimes rather those of gradual emaciation, predisposition to infection, etc., usually with slight tetany or tremors, appear after a period of eighteen hours to eight days after the operation, usually after two or three days. The course of the affection, to judge from this table, is by no means so violent and rapidly fatal as in the case of simple parathyroidectomy, although sometimes, as in at least four of twelve of our cases and in all of Jouty's four cases, the tetany is recorded as severe. The uniformity of the fatal tetany resulting from parathyroidectomy alone may be illustrated by the above table:

Dog.	Parathyroidectomy Interval before appearance of tetany.	Duration of tetany.	Its character.	Result.
104	2 days	2 days	violent	died.
109	3 days	—	violent	died.
113	5 days	5 days	moderate	died.
115	2 days	1 day	violent	killed during tetany.
116	8 days	—	violent	killed during tetany.
117	7 days	—	slight	still alive.
121	3 days	—	violent	killed in tetany.
124	3 days	—	violent	killed in tetany.
126	2 days	—	violent	died.
133	27 days	—	moderate	killed.
138	2 days	—	violent	died.
139	10 days	—	violent	killed.
141	7 days	—	violent	killed.
144	2 days	9 days	slight	given morphine, etc.
146	4 days	2 days	violent	given morphine, etc.
147	3 days	—	violent	killed.
148	2 days	9 days	violent	brain emulsion injected.
150	2 days	1 day	violent	died.
153	5 days	—	violent	killed
154	3 days	6 days	violent	brain emulsion injected.
157	1 day	3 days	violent	salt infusion.
167	2 days	3 days	slight	died, secondary thyroidectomy.
172	7 days	—	violent	died, secondary thyroidectomy.
175	2 days	—	violent	died, secondary thyroidectomy.
186	1 day		moderate	infused.

Unfortunately of the twenty-five cases nine were killed during the first violent attack of tetany, so that one cannot be absolutely certain that they would have died on the day when the tetany developed (as represented by the dash in the column headed "Duration of Tetany"). Nine cases died in the first attack of tetany, others underwent a protracted affection as a result of treatment of one sort or another. Lusena gives a table of nineteen cases of parathyroidectomy in which death occurred with tetany always within five days after the operation and within thirty-six hours of the onset of tetany.

On the whole then, although neither from our own cases nor from the others recorded in the literature can we arrive at results so uniform and satisfactory as Lusena's, the cases in which the parathyroids alone are extirpated seem to enter a violent tetany, leading more rapidly to death and with less tendency to the development of the symptoms of emaciation, cachexia, etc., than in the cases of thyroparathyroidectomy. Nevertheless, a considerable proportion of those cases do develop violent tetany—tetany which quickly leads to the death of the animal—and in practically all the cases the symptoms began quite as soon as in the other cases. With regard to Lusena's statement that the removal of the thyroid after the tetany of parathyroidectomy has begun will cut short the tetany, I have already made some remarks. Since the publication of that paper several experiments have been made along these lines. They are as follows:

Dog.	Parathyroidectomy.	Tetany.	Thyroidectomy.	Results.
128	Oct. 23	Oct. 25 10 A.M.	Oct. 25 10 A.M.	Tetany diminished for a few hours. Began again at 3 P.M. Dog died in tetany, 8 P.M., Oct. 25.
138	Nov. 23	Nov. 25 9 A.M.	Nov. 25 9.30 A.M.	Tetany increased and dog died at 3.20 P.M. Tetany was extremely violent and dog was bled for another experiment.
165	Oct. 24	Oct. 26 3 P.M.	Oct. 26 5 P.M.	Tetany disappeared. Extensive secondary hemorrhage occurred. Dog died Oct. 30.
167	Oct. 27	Oct. 29 12 NOON	Oct. 29 7.30 P.M.	Tetany of varying intensity throughout Oct. 30. Very slight tetany Oct. 31. Tetany disappeared. Dog apathetic and weak Nov. 1. Death Nov. 2.
172	Nov. 14	Nov. 21 9.30 A.M.	Nov. 21 11 A.M.	Died in violent tetany at 12.45 P.M. Tetany reappeared at once on recovery from ether.
175	Nov. 19	Nov. 21 2 P.M.	Nov. 21 3 P.M.	Tetany reappeared and became progressively more violent until dog's death at 6.15 P.M.

Of these six experiments four showed absolutely no effect upon the course of the tetany produced by the thyroidectomy. In one (165) the tetany was very slight before the thyroidec-

tomy and disappeared entirely after it. In 167 the tetany, also slight, continued, but became progressively milder until it disappeared just before death, which occurred four days later.

Lusena describes thirteen cases in which he either extirpated the thyroids or ligated their vessels, after having practised parathyroidectomy and allowed the tetany to appear, and without exception in these cases the tetany diminished or disappeared and the dogs continued to live for from four to twelve days after their second operation. In five cases in which instead of complete extirpation of the two thyroid lobes only one was extirpated or tied off, no effect upon the tetany was produced.

Our cases, except for the two in which the tetany was slight, and in which the dogs under ordinary circumstances might have been expected to show remissions and to live some days, showed absolutely no effect from the extirpation of the thyroids after tetany had commenced. These experiments one after another were so striking that, despite their relatively small number, we felt quite convinced of the contrary to Lusena's statement. The theory which Lusena has constructed is difficult to disprove, because it deals for the most part with hypothetical substances and with organs variable in number and position.

It is difficult to understand his position with regard to the action of the thyroid after parathyroidectomy, for, while in one place he states that the removal of the influence of the parathyroid allows poisonous substances to accumulate in the thyroid whence they are then suddenly returned to the blood, producing tetany, he does not explain how, after this has occurred, the removal of the remaining empty thyroid can ameliorate this tetany. He thinks that the accessory thyroids and hypophysis must be considered as rendering impossible any complete extirpation of the thyroid, but does not find that they accumulate and empty out sufficient toxin to appreciably alter the clinical picture resulting from the thyroparathyroidectomy. Presumably Lusena would explain the curative effects of parathyroid therapy as a stimulation to the thyroid to continue to neutralize poison. The result, however, is the same when the thyroid has been extirpated and then it would be necessary to refer the stimulation to the accessory thyroids and hypophysis, a theory which does not seem probable, but which we cannot absolutely disprove. The injection of fresh thyroid secretion, according to this theory, should, however, be quite as efficacious, if not more so, than the injection of parathyroid to stop the tetany, but even in Lusena's hands this is not so.

On the whole, although the cases reported by Lusena and others in the literature have shown a milder course after thyroparathyroidectomy than after parathyroidectomy, we cannot support this as a general rule, for in half of our cases the symptoms were of the maximum severity. Nor can we support Lusena's statement that subsequent thyroidectomy stops the tetany, for in four out of six of our cases it had absolutely no effect and the dogs proceeded to a more and more violent tetany and died. We therefore regard the tetany not as the result of a disturbance of the thyroid from the loss of the influence of the parathyroids, but as the direct result of the loss of parathyroid function, especially since it may be directly cured by injection of parathyroid emulsion in the absence of the thyroid.

TWO CASES OF PERNICIOUS ANEMIA DUE TO THE DIBOTHRIOCEPHALUS LATUS.

BY ALFRED MEYER, M.D.,
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THERE is perhaps no pathological state so commonly met with in private or in hospital practice, whether by the general practitioner or the specialist, as that of secondary anemia. In many cases the cause is readily ascertained: a hemorrhage, convalescence from a long febrile disease, a carcinoma, a chronic nephritis, a malarial toxemia, a tuberculosis, a leucemia; and the success of the treatment instituted depends more or less upon the success with which we can reach the etiological factor. Other secondary anemias—as for instance those accompanying chronic cystic degeneration of the kidneys—are in most cases not even diagnosed and their causative treatment therefore not even discussed. But there is a type of severe secondary anemia due to the presence of certain parasites in the intestines, notably the *Anchylostomum duodenale* and the *Dibothriocephalus latus* which, when recognized, are not only amenable to treatment by anthelmintics, but so prompt and striking is the cure at times that almost the whole field of medicine may be searched in vain for similar illustrations of its beneficent power. It ought to be both a warning and a stimulus to medical men not to be satisfied with the routine administration of iron and arsenic, especially in progressive anemia of obscure origin or long duration, but to examine the stools for links and ova, for upon their discovery may depend absolutely the issue of the case. The temptation to use iron is particularly great, for have we not a very large list of iron preparations to choose from? And is not the enterprise of chemists and pharmaceutical houses continually adding to the number? And may we not, varying the poet's language a bit, say with perfect truth that the medical profession is "Dragging a lengthening chain of iron behind it?"

It has often been observed and commented upon by medical men having large hospital services that if a rare disease occurs in the service, or a rare complication of a common disease, the same is not infrequently met with again after a short interval. Within the present year I have had confirmation of this "law of chances," if

you choose, in the wards of Mt. Sinai Hospital. For many years the stools of every patient suffering from a high grade of anemia, for which no cause could be found, have been systematically searched for intestinal parasites and their ova; never, so far as I know, was there found a single case of *Dibothriocephalus latus* anemia, and then, curiously enough, two cases followed each other within about a year—both of them anemias of the severest kind, clinically and microscopically. I shall only give extracts from the complete histories of the cases as taken by the house staff.

Case I.—Edith H., twenty-two years old, domestic, born in Finland; admitted November 6, 1903; marked tuberculous history on mother's side, but no subjective tuberculous history. Ill one year with weakness and increasing pallor with occasional vomiting. On admission the pallor was marked and of a yellowish hue, the conjunctivæ fatty looking, loud systolic murmurs at the apex and in the aortic area. Slight edema of extremities. No petechiæ.

Blood.—Red blood corpuscles, 780,000; white blood corpuscles, 5,000; hemoglobin, 15 per cent.; poikilocytosis, microcytes, macrocytes, cells showing polychromatophilic degeneration, some normoblasts.

Differential count 100 cells: Polynuclears, 37 per cent.; mononuclears, 8 per cent.; lymphocytes, large and small, 54 per cent.; mastzellen, 1 per cent.

Numerous ecchymoses upon arms and about ankles and trochanter. Large retinal hemorrhages, especially in the right eye. Temperature 100 to 102° F. for first twenty days in the hospital. The first few days no ova were found in the stools. On the eighth day after admission ova were found, but not recognized as those of any known parasite. A few days later 30 grains of thymol were given in two doses and four hours later a tapeworm was passed which proved to be a *Dibothriocephalus latus,* measuring 8 feet and 8 inches in length. Ova were still found in the stools from time to time, until nine days after the expulsion of the worm, when they disappeared for a period of three weeks and then were found again on one day only. For fear that there might be a second *Dibothriocephalus latus,* thymol and male fern were given successively without the expulsion of another parasite, and after that no ova were found during the remaining five weeks of the patient's stay in the hospital. The improvement of the patient was immediate and truly marvelous. The mucous membranes steadily and rapidly improved in color, she gained thirteen pounds in weight, the hemoglobin rose from 15 to 63 per cent. and the red blood cells from 780,000 to 3,460,000.

Case II.—The history of this patient was as follows: Is still in the Mt. Sinai Hospital. Jennie L., twenty-five years old, married, born in Russian Poland; admitted December 7, 1904. First child born four months ago. Her illness began about two months before birth of baby with swelling of feet and legs. Pallor began about the same time and progressively increased. Says that she saw segments of worm in stools about one year before. Marked pallor of body and mucous mebranes with an icteric tinge; edema of lids and of extremities; systolic blowing murmur at apex and pulmonic area. Temperature, 101.2° F.

Blood.—Red blood corpuscles, 660,000; white blood corpuscles, 5,400; hemoglobin, 10 per cent.

Differential count, 200 cells; polynuclears, 53½ per cent.; eosinophiles, ½ per cent.; large mononuclears, 15 per cent.; large lymphocytes, 6 per cent.; small lymphocytes, 25 per cent. Marked poikilocytosis and basophile degeneration; one normoblast, 6 megaloblasts.

Dr. Grüning, who made the fundus examination, reported numerous hemorrhages along the veins, also hemorrhages where there are no veins. When I first saw this patient and before the report of the stool examination was handed in, I was inclined to regard the case as one of progressive pernicious anemia of the pregnant, of which seven fatal cases were originally reported by Gusserow of Zurich, Switzerland, in 1871, and of which type I have reported one case without autopsy in the Mt. Sinai Hospital reports of 1898. I might very reasonably omit this reference to my first erroneous impression of the case, because it was not a final diagnosis and necessarily was subject to revision after the stool examination which I immediately ordered, and which examination had actually been begun by the house staff before the order was given. But I mention it deliberately in order to show the very grave condition of the patient that would have justified such an opinion—an opinion which, if verified, would have meant death in a few weeks. The following day a large number of ova of the *Dibothriocephalus latus* were found in the stools. Thymol was given in half-dram doses with the same precautions as in the first case in regard to withholding the food and the administration of castor oil the day before and two hours after the remedy, but the worm was not expelled. The same negative result with 2½ drams of the ethereal extract of filix mas.

December 19: Red Blood corpuscles, 556,000 (a loss in eleven days of 100,000).

January 3: Red blood corpuscles, 468,000 (another loss of about 90,000).

January 7: Some segments of *Dibothriocephalus latus* passed and ova were found for the first and only time since the administration of anthelmintics was begun. Many and varied doses of thymol, filix mas and pelletierine sulphate were employed but without expelling the parasite (so far as known).

January 16: Red blood corpuscles, 1,176,000 (nearly trebled in thirteen days); white blood corpuscles, 5,800; hemoglobin, 21 per cent. (doubled in the same period).

It is hard to determine why in some cases the *Dibothriocephalus latus* develops only slight gastric or nervous symptoms and in others the severest grades of anemia. Braun (Thier. Parasiten des Menschen, p. 202) believes the latter due to the absorption by the hosts of poisonous material excreted by the parasite. In this connection it is interesting to note that in the second case reported by me the improvement in the anemia followed soon after the use of anthelmintics and the disappearance of eggs from the stools.

The worm has not been discovered in the stools up to the present time (February 2), but the persistent absence of ova for a period of twenty-six days[1] makes it probable that the same has been expelled and escaped the observation of the nurse.

I saw the patient this afternoon. She is steadily improving. The last blood examination shows: Red blood corpuscles, 1,648,000 (nearly quadrupled in twenty-four days); hemoglobin, 36 per cent (nearly quadrupled in twenty-four days). Only a faint systolic murmur is still present in pulmonic area.

In view of the claim that has been made in some quarters "that healing may occur without removal of the worm or before the worm has passed and that possibly the improvement is only a temporary improvement of a pernicious anemia," I have determined to keep the patient under observation for some months at the hospital in order to continue the search for ova, and, after her discharge from the institution, to watch for a relapse of the anemia. I shall take pleasure in reporting upon her case again at some future time.

A CASE OF DIBOTHRIOCEPHALUS LATUS INFECTION, CAUSING PERNICIOUS ANEMIA; WITH COMPLETE RECOVERY.[2]

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THE symptoms produced by the presence of intestinal worms are peculiar in the facts that they vary greatly at different periods in the same person and that the symptoms caused by several varieties of parasite may be identical. Thus Davanie, the French helminthologist, says that "*Tænia, Bothriocephalus, Ascaris* and *Oxyuris* may all give rise to similar phenomena." The *Dibothriocephalus*, however, affords an exception in that at times it is capable of producing a most serious and even fatal anemia, which may assume a truly "pernicious" type, with hemorrhages. The symptoms of parasitic infection of the intestine by the larger worms are explainable upon several grounds. For example: (1) A very large worm or colony of worms may cause mechanical obstruction. (2) Active worms may irritate the intestinal wall, giving rise to loss of function, and causing remote reflex nervous disturbances. (The consumption of nutritive material by the worm itself is relatively so small as to be unworthy of consideration.) These explanations, however, prove insufficient, for in the most serious cases there are nervous phenomena and degrees of anemia which are only to be accounted for upon the theory that the worms periodically, if not constantly, excrete toxic substances which are absorbed from the alimentary canal. Such symptoms are convulsions, tremors, paralysis, chorea, perversions of special sense, great weakness, both mental and physical, and extreme anemia with hemorrhages. (3) The theory of special toxemias produced by the worms would satisfactorily account for all of these symptoms, and is reinforced by the fact that reactionary changes, such as eosinophilia, may be produced in the blood. The absence of symptoms or their intermittency may be accounted for, as such phenomena are explained with other parasites, as for example the *Plasmodium malariæ, i.e.*, the parasites themselves, may possess varying degrees of activity, depending upon food or other conditions; the human system may present varying degrees of resistance, or the blood may possibly supply varying quantities of antitoxins.

In further confirmation of the special toxemia theory is an exceedingly interesting series of experiments reported in 1904 by S. Isaac and von den Velden[1] who discovered that when an extract of the fresh proglottides of the *Dibothriocephalus latus* was added to blood serum from a patient harboring the parasite, an albuminous precipitin was obtained. This precipitin reaction was not obtainable from the blood serum of uninfected persons, and the reaction is therefore specific.

Tallqvist and Schaumann have also lately shown that serious anemia may be produced in dogs by inoculating them with an extract derived from the fresh parasite.

It is an interesting fact that in the pernicious anemia caused by the *Dibothriocephalus latus* eosinophilia appears to be absent, as it is from idiopathic pernicious anemia, although it is a common enough phenomenon in connection with other forms of intestinal parasites. In three cases of such parasitic infection the presence of an unusually high degree of eosinophilia has led me to have the patients' stools searched for worms or ova, which thus for the first time were discovered.

The *Dibothriocephalus latus* was so named by Linnæus in 1758, although it was known to exist at a much earlier date. It is also called *Tænia lata* in the tenth edition of Linnæus' Systema Naturæ. It is often erroneously called "*Bothriocephalus*," and was classed by Bremser in 1819 in the germs bearing that name. Dr. C. W. Stiles informs me, however, that "for some years it has been known to zoologists that the species *latus* could not remain in the genus *Bothrio-*

[1] Fifty-one days at time of reading proof.

[2] Read before the New York Academy of Medicine, February 2, 1905.

cephalus; and Luehe, in 1899, made it the type of the new genus *Dibothriocephalus*—thereby restoring its original name."

The *Dibothriocephalus latus,* or "broad tapeworm," possesses wide, flattened segments that vary much in size, and may number 3,000 or 4,000, which makes it the longest human tapeworm, its length sometimes exceeding 30 feet. The head, which is club-shaped, is unarmed with hooklets or rostellum, and is depressed at the sides, where there are two longitudinal deeply grooved suckers. There is a long, thin neck, and, unlike many tæniæ, the body tapers toward both extremities.

Extending from the neck, the proglottides, which have yellowish margins and blue-gray centers, are very wide, but short in the anteroposterior diameter. The largest, according to Dock,[2] measure 10 to 18 mm. by 5 to 6 mm. The yellowish, rosette-like uterus is centrally situated, and cirrhus and vagina open immediately behind it on the median ventral surface. The testicles are situated laterally. The elliptical ova are brown and granular, with a thin capsule, and average .07 mm. in length by .045 mm. in width. At one extremity is a curious lid, like a small trapdoor. The number of worms found in the same person may be quite numerous. James Ewing found three in one patient, and Böttcher as many as 48 in a woman. The parasite is sometimes associated with other species in the human intestine.

It was first demonstrated by Max Braun that the intermediate hosts of the parasite are certain fish, like the pike, carp, salmon and trout, in which the *Plerocercus* is found, hence the parasite abounds in countries in which these fish are extensively used as food and sometimes are eaten raw, or salted or smoked without cooking, processes which do not destroy the embryos. The mode of infection of the fish has not yet been satisfactorily explained, but cats and dogs are known to harbor the parasite. It is found in man in the Baltic provinces of Russia, whence it is carried to Finland and Sweden, and sometimes to Holland, Bavaria and Rumania. It is also found in man in parts of Switzerland, in Mexico, and is said to be the most frequently observed cestode of Japan, where it infests both man and the dog. In certain localities a large proportion of the community may become infested, for example, near Lake Geneva 20 per cent. and in Moscow 9 per cent. of those examined have shown either the worm or its ova.

In the United States a few cases have been reported from time to time among immigrants. Dock[3] reported two from Galveston, Texas, and one from Leadville, Colo. Max Braun refers to a case in Philadelphia, Theodore Janeway reported one case, James Ewing one case (in New York), and Horace M. Bellows a case in a girl who had been traveling in Egypt and passed 19 feet of the tapeworm after taking pelletierine. Wm. N. Berkeley[4] reported four cases in 1903, all among immigrants. One of these patients was a Russian woman, who had passed segments of the worm at intervals during eight years, in all of which time her only symptom had been occasional slight abdominal discomfort. After a dose of oleoresin of aspidium the worm was expelled complete. Two cases were referred recently for diagnosis to Dr. T. W. Hastings, at the Clinical Laboratory of the Cornell University Medical College. In both cases the patients were immigrants recently arrived in New York.

In the *Veterinary Magazine*[5] Dr. C. W. Stiles, writing from the Bureau of Animal Industry, states that "Of all the 300 or more specimens of human tapeworm from patients in various parts of this country which have passed through my hands during the last three years, three specimens have been *Dibothriocephalus latus,* and the rest have been *Tænia saginata.*"

Dr. Stiles informs me that "in the United States Public Health and Marine Hospital Service collection is a specimen of *Dibothriocephalus latus* sent in by Assistant Surgeon Claude C. Pierce from Mullet Key, Fla., in 1902. This specimen came from a dog which was brought over by a Norwegian vessel."

In none of these cases in man does it appear that anemia reached a pernicious or even serious type.

In 1886 Gustav Reyher[6] reported 13 cases of pernicious anemia due to this parasite, all of which were cured by removal of the worm, and in the same year Heinrich Schapiro[7] reported another case, also cured, after the red blood cells had been reduced to 837,000 and the hemoglobin to 30 per cent. In 1887 J. W. Runeberg[8] cited seven cases with pernicious anemia, all resulting in cure.

All of these pernicious cases, however, were studied before the day of accurate differential blood counts, and the diagnosis of the variety of anemia was based upon the red blood cell and hemoglobin estimation alone.

The case which appears to most closely resemble the one herein reported in detail is described by Witold Orlowski in the *Krakow Medical Journal.*[9] The article, being Polish, I am naturally unable to read, but from the Greek nomenclature of the blood examinations (which appears to constitute a sort of medical Volapük), I have gathered the following data: The minimum blood count, several having been made, showed: Red cells, 295,375; white cells, 3,170; hemoglobin, 15 per cent.; color index, 1.93; megalocytes, 6 (400 counted); lymphocytes 52 per cent., and eosinophiles 1 per cent. There were no normoblasts or megaloblasts. The patient appears to have recovered, at least to have improved greatly under treatment, for the last blood examination records: Red cells, 3,125,000; white cells, 3,720; polymorphonuclear cells, 64 per cent.; lymphocytes, 32 per cent.; microcytes, 6 per cent. and eosinophiles, 1.5 per cent.

The case herewith reported (with specimens of ova and stained uteri and proglottides, prepared by Dr. T. W. Hastings, of the Cornell Clinical Laboratory) was studied in 1904 in the wards of Bellevue Hospital, in the service of Dr. C. L. Dana and the writer.

The patient was a boy, aged seventeen years, a native of Finland, employed as a plumbers' apprentice. He gave no family history of importance or any personal history until about seven months prior to admission to the hospital, when he first noticed increasing pallor. A month later repeated attacks of epistaxis occurred on successive days, one of which lasted half a day. He also began to suffer from dyspnea on exertion. A month before admission his legs became edematous, and as his weakness increased, he lost some 30 pounds in weight, and having had about 50 attacks of epistaxis, he applied to the hospital for relief. A month before admission he took a dose of a decoction made from some seeds which had been sent him from Finland to rid him of a tapeworm of several years' growth. He said that very many of his countrymen were similarly afflicted. He passed about four feet of the worm, as he thought, with the head attached.

had a transient attack of blindness in the left eye the week before the examination. The patient had several more severe attacks of epistaxis, which were controlled with difficulty. The temperature on admission was 104° F. for three days, with a pulse of 120, and for two weeks thereafter it ranged between 100° and 101° F., becoming subsequently normal. Soon after admission the ova of the *Dibothriocephalus latus* were observed in the feces, with a few red blood cells. During a period of eight weeks the patient was given five doses of the oleoresin of aspidium, 3i in each dose, and on four occasions thereafter he passed several feet of the parasite,—in all about 25 feet,—but no head was discovered. The administration of male fern was preceded by a period of starvation, and followed in twelve hours by castor oil. In addition the patient received adrenalin chloride, Fowler's solution, Basham's mixture and sodium cacodylate. At the height of his illness the patient had incontinence of both urine and feces. After three weeks of treatment the hemorrhages ceased and the general condition, including the anemia, began to show steady improvement, which was maintained until the patient was discharged, after three

Date, 1904.	Red cells.	White cells.	Hemoglobin.	Polynuclear.	Lymphocytes.	Large Mononuclear.	Transitional.	Eosinophiles.	Mast cells.	Normoblasts.	Megaloblasts.	Color index.	No. counted.
April 4	608,000	2,000	20%	70.1%	26.3%	2.9%	0.	0.3%	0.3	2.6	0.	1.6	600
" 7	760,000	3,600	20	60.	24.5	11.5	4.	0.	0.	8.	4.		200
" 16	1,000,000	3,300	20	65.	22.5	6.	4.5	2.	0.	3.	2.	1.	400
May 13	2,884,000	6,000	60	77.5	10.	4.	3.5	4.5	0.5	0.	0.	1.19	300
June 14	3,776,000	10,000	85	60.	16.	4.	9.	9.	0.	0.	0.		300
Nov. 24	5,980,000	10,000	98	55.	26.6	6.3	5.6	5.6	0.6	0.	0.		300

Upon admission the boy presented a typical clinical picture of pernicious anemia. He appeared well nourished, but was of a pale lemon-yellow color. There was moderate edema of the legs and the cervical glands were enlarged upon the left side. The pulse was quick and compressible; the heart appeared normal in size, but presented an apical systolic bruit, and another at the base transmitted to the muscles of the neck; the pulmonic second sound was accentuated; the leg reflexes were diminished, but there were no other nerve symptoms; the abdominal viscera appeared normal; the urine was slightly albuminous, with a few hyaline casts and uniformly low specific gravity, which, on repeated examinations, was between 1.007 and 1.010; there was moderate dyspnea and a few crepitant râles were heard at the base of the right lung. The patient had repeated epistaxis, but examination of the nasal cavities revealed nothing abnormal. Dr. Alexander Duane, who examined the eyes for me, reported the optic disks as being very pale, with small veins and arteries, secondary atrophy and several small hemorrhages in the fundus, but none in the maculæ or periphery; motion of the eyes and vision was normal, but the patient had

months, apparently cured and with normal blood. A table of six representative blood analyses is presented above.

The features of special interest in the blood examinations are as follows: (1) The complete restitution of the red cells from a count of 608,000 to 5,980,000, and of the hemoglobin from 20 per cent. to 98 per cent.; (2) the early high-color index (1.6); (3) the absence of eosinophiles in the earliest examinations; (4) the early high percentage of macrocytes; (5) the early presence of normoblasts and megaloblasts, and (6) the early leucopenia.

These characteristics fairly entitle the case to be classed as one of extreme pernicious anemia with complete recovery. Doubtless the hemorrhages greatly intensified the anemia, but the differential count showed more than a mere secondary anemia, *i.e.*, a specific anemia caused by some form of toxemia produced by the intestinal parasites.

This case is of exceptional interest as forming a type of pernicious anemia with definite etiology. The question has lately been much discussed as to whether there is such a disease as a "primary idiopathic" anemia, originating *de*

novo in the blood-forming structures of the body (bone marrow, various glands, etc.), and the view has been advanced by certain clinicians that there is always a prior cause, making this disease a secondary rather than a primary or idiopathic anemia. I am about to publish in the First Medical and Surgical Report of Bellevue Hospital (now in press) notes on 14 cases of pernicious anemia. In only two of these cases, which terminated in complete recovery, was it possible to determine the etiology. One of them was secondary to chronic endocarditis and gastritis; the other was the parasitic case above described. Nine of the 14 cases terminated fatally and in six autopsies were obtained. In five of the six autopsies a condition of advanced chronic interstitial or atrophic gastritis was observed. In these, as in many similar cases which have been reported, it was not easy to determine which was the antecedent condition, the gastritis or the anemia. Pernicious anemia occurs without permanent gastric atrophy, as in the parasitic cases, and many types of gastritis are observed without any blood changes other than those of the ordinary secondary variety. The essential matter is that at least one definite toxic cause of pernicious anemia being established, there is ground for belief that others may be discovered to explain the etiology of this obscure disease.

REFERENCES.

1 Deut. med. Woch., 1904, xxx, 982.
2 The Am. Syst. of Medicine, Vol. III, p. 328.
3 Loc. cit., p. 329; MEDICAL NEWS, 1903, Vol. LXXXIII, p. 517.
4 MEDICAL NEWS, 1903, August 1, p. 203.
5 Veterinary Magazine, May, 1895, Vol. II, (5), p. 284.
6 Deut. Arch. f. klin. Med., 1886, p. 31.
7 Deut. Arch. f. klin. Med., 1886, p. 416.
8 Deut. Arch. f. klin. Med., 1887, p. 304.
9 Przegl. lek., 1903, xliii, 151, 168.

SYMPTOMS AND DIAGNOSIS OF CEREBROSPINAL MENINGITIS.

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IN considering the symptoms and diagnosis of cerebrospinal meningitis as a part of the symposium in which it is my privilege to participate to-day, I shall limit myself mainly to the rehearsal of experiences with this dread disease in the central counties of New York State. Two facts are noteworthy: (1) There is not a single year when cerebrospinal fever fails to claim its victims in Central New York; (2) The disease may be either sporadic or epidemic. A search of the vital statistics and hospital reports proves the truth of the first statement. We are reminded by these statistics that individual and rare experiences are often readily forgotten. In the city of Syracuse there have been 175 deaths during the past eleven years due to cerebrospinal meningitis; 499 have died of meningitis. The deaths during this period were reported as follows:

	Cerebrospinal Meningitis.	Meningitis.
1893	11	55
1894	4	61
1895	17	61
1896	18	51
1897	12	51
1898	19	71
1899	45	43
1900	13	29
1901	9	23
1902	19	32
1903	8	22
	175	499

During these years there were no large epidemics of the disease. The majority of cases were considered sporadic, either primary or secondary. In 1899 there were a few house epidemics; the disease existed also in a limited area without attacking many. The records of St. Joseph's Hospital in the city of Syracuse show that there were 24 cases of cerebrospinal meningitis admitted from January, 1894, to October, 1904, with 16 deaths, a mortality of 66⅔ per cent. It is interesting to note that during the year when there were 45 deaths in the city of Syracuse, the larger number probably epidemic, not a single case of cerebrospinal meningitis presented for admission to St. Joseph's Hospital and that this was the only year during many when our wards were free from the disease. Through the kindness of Drs. Darlington and Guilfoy, of the Department of Health of the Borough of Manhattan, I am able to show the continuous presence of the disease within the city of New York. The number of deaths from cerebrospinal meningitis is as follows:

Year	1894	213	
"	1895	204	
"	1896	178	
"	1897	232	
"	1898	258	
"	1899	287	
"	1900	201	
"	1901	201	
"	1902	210	
"	1903	195	
"	1904	1,010	Jan. 1 to Nov. 1, 1904.
Total		3,189	

The high mortality during 1904 was due to the prevalence of the disease in epidemic form. This epidemic did not reach Central New York.

During years when epidemic cerebrospinal fever has spared the central counties, non-epidemic cases have dotted our cities and country districts indiscriminately. The disease claims the larger number of its victims from the homes of the poor; yet it is not infrequently found in homes where sanitary conditions are good. There have been but few serious epidemics of cerebrospinal meningitis in Central or Northern New York. When present, the number of cases have been surprisingly small; these showed no continuous extension, while the mor-

tality has been discouragingly high. The disease has been held within a narrow precinct of the city or a corner of the county township. So infrequent have serious and extensive epidemics been that there are among the Nestors of the profession living in Onondaga County to-day only two or three who recall more than one severe epidemic, and that in 1855 and 1856, the most fatal visitation of the disease ever experienced in Central New York, in which many were attacked. The central counties of the State were invaded. As a rule, when epidemic cerebrospinal meningitis has visited this country, the same surprises have been in store for us as have been noted by foreigners, in the remarkable limitation of its ravages, the small number originally attacked, always with a high mortality. These facts were well illustrated in the epidemic form of the disease on board the U. S. Receiving ship Minneapolis, as reported by Surgeon Stokes in the Report of the Surgeon-General, U. S. Navy, 1903. The ship was overcrowded with 1,450 men on board at the time of the outbreak, yet only 23 cases developed; of these 6 died, an unusually low mortality of 26 per cent.

Epidemic cerebrospinal meningitis is due to the meningococcus of Weichselbaum, a fact which was promptly corroborated in this country by Councilman and others. It has been demonstrated both clinically and experimentally that pneumococcus cerebrospinal meningitis and meningitis are more virulent than are those forms of the epidemic disease due to the meningococcus. Heubner says, "the benign nature of the meningococcus as compared with the virulence of other meningitis-producing germs, accounts for the comparatively few cases during epidemics, their ready control with the subjugation of the germ." Sporadic or non-epidemic cases are likely to run a much shorter and more fatal course than do those of meningococcic origin. Netter makes the statement that pneumococcus meningitis is almost uniformly fatal. Of 68 cases, 61 died during the first days of the disease. Only one-third of the meningococcus cases died. The majority of these run a protracted, often irregular and even an intermittent course. Some continue weeks and months. There are exceptions to this behavior, as was exemplified by an epidemic of the disease as it raged in a corner of the town of Cicero about thirty-three or thirty-four years ago. The cases were met in the practice of the late Dr. Blynn. There were a number of families living near each other; all children infected attended the same district school. Death claimed its victims within the first twenty-four hours of the disease. There were no sporadic cases. With but few exceptions the disease was confined to children. The few who lived long enough had the classical symptoms of epidemic cerebrospinal meningitis and those who recovered had sequelæ which relegated some to a mattress grave, some were robbed of their hearing or sight, while others recovered with less serious damage. This was before the days of bacteriological diagnosis, but the behavior of the epidemic and its comparison with those of to-day justify the conclusion that it was of the meningococcic variety and that occasionally this is found malignant—prompt in claiming its victims. Such a "lightning" course has been experienced since the days of lumbar puncture and has been confirmed by accurate bacteriological diagnosis, but is exceptional. The fatality of the disease, its sequelæ, with final permanent damage to vital organs and the special senses in a large number of those who live, have led the lay world and the profession to fear the infection, whether epidemic or sporadic. There are cases so mild, it is true, that they may originally escape detection; some of these are recognized only, or suspected, when the disease has attacked others more violently in the same house or neighborhood.

Another interesting fact which has been noticed in Central New York is the presence of other infectious diseases of the nervous system during the prevalence of even limited epidemics of cerebrospinal meningitis. On three occasions within the past ten years we have met cases of cerebrospinal meningitis, acute poliomyelitis anterior and Landry's paralysis almost side by side, in which the diagnosis of each was positive.

Cases of poliomyelitis anterior, occurring endemically, have, in the middle counties of the State, been present with a limited number of undoubted *Meningococcus meningitides*. This has not always been the rule. A limited epidemic of poliomyelitis anterior was found in Oneida County in the practice of Dr. Huntley, in which there were no other cases of infectious nervous disease. Those found bore no resemblance to cerebrospinal meningitis.

House epidemics of the disease in which from two to five members of a household were attacked, and these without further spread of the disease, have been met on five different occasions.

Cerebrospinal meningitis is rare after the fortieth year. In sporadic cases occurring in adults, mental strain and long-continued worry may prove inviting factors. Eichhorst reports two epidemic cases hastened, he believed, by mental fatigue. Sporadic cases offer no positive subjective symptoms which differentiate these from those of epidemic origin. Bacteriological and cultural tests only give information which insure safety and give that protection to which we are at all times entitled. One attack probably gives immunity. Councilman found but five cases in which the disease showed itself twice in the same individual.

There are unexplainable factors which modify the severity of both forms of the disease during different years and materially influence its course. With sporadic as with epidemic cases, all degrees of severity are found. In all forms of cerebrospinal meningitis, *ophistotonos* is rarely absent; so constant is this symptom that the Germans have named the disease "Genickstarre."

The *headache* of cerebrospinal meningitis is almost always severe. Its persistence and appreciation by the patient as consciousness departs and while merging into deep coma becomes impressive. We cannot easily forget the persistent groan and occasional shriek when the sensorium to all appearances seems thoroughly blunted.

General *hyperesthesia* is the rule.

Photophobia is usual. *Pressure upon nerve trunks* is usually painful, often causes the patient to shriek and may give rise to general contractures or tremor.

The *facies* of the patient and characteristic *position in bed* with rapid wasting of muscle and fat, with legs drawn in anomalous positions, are not easily simulated by other diseases of the nervous system.

The *knee-jerk* is absent in one-sixth of all cases. In one-tenth this phenomena is absent to reappear during convalescence. In a number of cases the deep reflexes have been exaggerated. In some these have been slightly decreased. The variation in the behavior of the reflexes in different cases proves that these follow no rule.

Insomnia is almost always present.

Respiration may be increased, *bronchial catarrh* becomes a frequent complication. Sudden temporary cessation of respiration (Biots' respiration) or Cheyne-Stokes breathing may sometimes be present, though less frequent than in tuberculous meningitis.

The *pulse* and *temperature* offer nothing characteristic other than the acceleration of the former and the elevation of the latter. As death approaches, the pulse becomes exceedingly rapid, due to vagus paralysis.

Hyperpyrexia has characterized some cases. Some of these have been of the foudroyant type, ending in a few hours.

The abdomen is retracted in the majority of cases, constipation is the rule.

The *urine* continues to be secreted in good quantities, albuminuria is usual, glycosuria occasional. *Pressure along the spine and occiput* continues exquisitely painful almost to the end of the disease.

The *skin* supplies a number of lesions in *herpes, erythema, roseola* and *hemorrhage. Herpes labialis* is less common as a symptom of epidemic cerebrospinal meningitis than either roseola or hemorrhage. Herpes facialis is more frequent in Germany than in this country. Ziemssen says, "in no other disease have I observed facial herpes which spread so widely." It is present early, there are repeated crops, its presence is of no prognostic value. *Hemorrhage* which has given to the disease the name "spotted fever," a misnomer, is not always present, and in some cases seen in Central New York was absent. Large cutaneous hemorrhages and bleeding from mucous membranes are ominous, indicating malignancy. The *cerebral macule* has been early and persistent in most cases.

Convulsions are rare in adults. Children, particularly the very young, are likely to begin the disease with tonic spasm. *General epileptiform convulsions* have occasionally been present.

Tonic spasm limited, without full convulsions, is quite characteristic of the beginning posterior-basic meningitis of the English, which Lees and Barlow describe in Allbutt's System. The majority of these are undoubtedly cases of cerebrospinal meningitis. A thorough study of the 50 post-mortem reports appended to the article mentioned shows that the spinal membranes were involved in 26 of these cases; in eight the cord and membranes were found normal; in 16 of the cases the cord was not examined, or no mention is made of such examination, and in two of the 26 cases in which the spinal membranes were involved, only the upper inch or two of the cord was examined.

Vomiting has characterized the cases in which there has been an unusually long prodromal period. It is less common than in tuberculous meningitis, although it may be present at any time before the final deep coma of the average case. *Conjunctival redness* with edema and, at times, chemosis, are common. The lips and tongue are dry and cracked, while sordes accumulates on the teeth as in typhoid. *The eye and ear symptoms* will be considered separately in this symposium. As a rule, the blood shows a marked polynuclear leucocytic increase, ranging from 9,000 to 24,000. Tuberculous meningitis rarely gives evidence of marked leucocytosis. A few cases have been described in which this has been found (Osler, Ridder and Zappert).

Metastatic joint inflammation was found in three cases of which we have records. When this occurs early, its differential diagnosis from acute rheumatism and pyemia may present difficulties. In one of our cases, a woman aged twenty-four years, the early symptoms were limited to the ankle-joints. There was hyperpyrexia, severe headache, rapid development of opisthotonus which cleared all doubt. This patient died in the second week of the disease of purulent cerebrospinal meningitis with suppurative changes in all joints involved. Fronz and Osler have called attention to this complication in elaborate and valuable articles. Both observers found meningococci in the joints.

Splenic enlargement is usual, the spleen is not as large or easily palpated as in some other acute infections.

The Kernig phenomenon is present in almost all cases of cerebrospinal meningitis. If the patient is made to sit up or nearly so and an attempt is made to extend the leg, a marked contraction of the flexor tendons is felt in the popliteal space with inability to straighten the leg. Kernig in his original article makes the following statement: "This phenomenon is so striking, the difference between nothing and something, between the complete absence of the contraction while the patient is lying down and its presence

when the patient sits up, is so plainly perceptible that it is well worthy of consideration and special attention should be paid to this symptom, its presence looked for in all cases." In 15 cases of meningitis Kernig found this phenomenon present. In eight of these the diagnosis was confirmed post mortem. Of the 15 cases, 13 were epidemic cerebrospinal meningitis. This sign is not limited to meningitis, it is occasionally present with other diseases. In six of Kernig's cases, not meningitis, but with brain symptoms with pial trouble, the phenomenon was more or less marked. Kernig believes that it is an early manifestation, as early as opisthotonos, and that it is late to disappear.

In considering the importance of this phenomenon in the diagnosis of cerebrospinal meningitis, it must be conceded that but few cases have been found in which it could not be demonstrated early, and in which it did not continue until the end of the disease. However, as a differential sign in grave infections, such as pneumonia and typhoid fever, in which all symptoms may be masked during the several days because of the presence of brain symptoms, its presence and possible persistence may become misleading. Thus we have found cases of pneumonia in which the Kernig phenomenon was present with and without the associated changes in the brain. Our experience at St. Joseph's Hospital during the past few months strengthens the conclusion that the phenomenon is absent, as a rule, in cases in which the meninges are not involved but that it is not always present with meningitis. Dr. Harris kindly examined for me 121 patients at St. Joseph's Hospital, including 61 medical and 60 surgical cases. In only one of these did he find the Kernig phenomenon, that a case of tuberculous meningitis. In three cases of meningitis included in this number the Kernig phenomenon was absent. One of these followed a fracture at the base of the brain, the second proved to be purulent cerebrospinal meningitis with brain abscess, opisthotonos was marked, the third followed a fracture at the base of the brain with associated apex pneumonia. In 90 per cent. of the cases of cerebrospinal meningitis seen during the past six years we found the Kernig phenomenon present. Friss, of Copenhagen, reports 60 cases of cerebrospinal meningitis, in 53 of which he found the Kernig symptom, *i.e.*, 88 per cent. Netter's experience is of value. He reports 25 cases of meningitis including 12 of epidemic cerebrospinal meningitis in which the Kernig phenomenon was present in 23, or 92 per cent. Kernig, Henoch and Netter have called attention to the value of this symptom in clinching the diagnosis of cerebrospinal meningitis, even during the period of convalescence in cases where the disease was not originally suspected and where the diagnosis of the disease in other members of a family was aided by its persistence. Herrick's experience in 19 cases, including nine of the epidemic form of the disease, showed the presence of the Kernig phenomenon in 17 cases or 89.4 per cent. In none of these cases was it needed to make the diagnosis positive. Lewin reports 29 cases of meningitis in which the phenomenon was present in 21. Its early presence with a few brain symptoms has, on several occasions, created a strong suspicion of cerebrospinal meningitis. Such a case was seen with Dr. Joy at Cazenovia in which the Kernig symptom was present early with increasing headache without opisthotonos, stupor or vomiting. Depending upon this symptom with headaches, cerebrospinal meningitis was strongly suspected and finally developed. In two cases seen in private practice with few or no added classical symptoms early, the Kernig phenomenon has been of diagnostic value, creating a strong suspicion at least approaching cerebrospinal meningitis. We must emphasize the fact that the suspicion is only strengthened in these cases, for the Kernig phenomenon is by no means pathognomonic of cerebral or cerebrospinal meningitis, and that it is often absent in meningitis, as our experience at St. Joseph's Hospital proves. Taken alone, its value may be overestimated; when used as a link it adds great strength to the diagnostic chain.

Lumbar puncture.—The subarachnoid space is the only hollow in the body which normally contains an appreciable quantity of fluid. Thus, the brain and cord are suspended without anywhere coming in contact with their bony covering. This fact makes it possible for the clinician, in the majority of cases, to follow the maneuver of Quincke and withdraw this fluid, by means of a trocar and canula from the lumbar region for close macroscopic and microscopic examination, staining and cultural experiments.

In considering the value of lumbar puncture in the diagnosis of cerebrospinal meningitis, I would call attention to two underlying facts: (1) The normal pressure within the subarachnoid space is increased; (2) the fluid is materially changed and as a rule holds the specific microorganism responsible for the meningitis.

Thousands of punctures cautiously made have proven the possibility of determining in an overwhelming number of cases the nature of the underlying infection. The macroscopic appearances of the fluid withdrawn have led some observers, whose experiences have been large, to conclusions which ought not be accepted by the inexperienced without confirmation either by microscopical examination or cultural experiment.

Lichtheim, Frohmann, Schiff, Pfandler and Lange believe that flocculi or coagulæ which precipitate from the fluids are characteristic of tuberculous meningitis. On the other hand, Stadelman refuses to subscribe to this view. The majority of observers have formulated the rule that with purulent cerebrospinal meningitis the fluid is turbid and contains pus; that the absence of flakes from the fluid (Stadelman, Orgelmeister) does not argue against the possibility

of a tuberculous process, nor is their presence positive evidence of tuberculous meningitis. Serious errors will be made if we depend upon the macroscopic examination of the withdrawn fluid alone. Orgelmeister reports an unfortunate experience in which the diagnosis of meningitis with abscess of the brain, correctly made, was changed to tuberculous meningitis because the fluid contained fibrinous flakes with increase of leucocytes but without micro-organisms or tubercle bacilli. The post mortem proved the correctness of the original diagnosis—cerebrospinal meningitis with abscess in the left temporal lobe. Polynuclear leucocytes may be taken, when found in the lumbar fluid, as pointing strongly to the purulent form of cerebrospinal meningitis and to non-tuberculous disease. The experiences of Wentworth, Pfandler, Widal, Ravout, Monod and Sicard strengthen the diagnosis of tuberculous meningitis when there is mononuclear leucocytic increase. Lymphocytosis of the withdrawn fluid, therefore, argues against ordinary sporadic or epidemic cerebrospinal meningitis. Macroscopic and microscopical examinations of the withdrawn fluid can ultimately serve only to strengthen suspicions. The greater and scientific value in the differential diagnosis of the various forms of meningitis, cerebral and spinal, must depend upon the demonstration of the specific organism. This, lumbar puncture enables us to do in a large majority of cases, proving its utility, not only as a means of diagnosis, but for prognosis and treatment of the disease under consideration.

Prophylactic measures must of necessity follow accurate bacteriologic diagnosis in this as in other contagious infections. Failure to find, on staining, in the withdrawn fluid, tubercle bacilli or other meningitis-producing germs with positive evidences in symptoms of cerebral or cerebrospinal meningitis may occasionally postpone accurate differentiation. Cultures of meningococci and pneumococci may be grown in from twenty-four to forty-eight hours, tubercle bacilli in from ten to fourteen days.

Hansemann in his recent publication (Lehrbuch der klin. Untersuchungsmethoden (1904), Eulenberg, Kolle und Weintraub) says: "Lumbar puncture has been largely practised during recent years. There have been hundreds, yes, thousands of these. I do not believe that there are many cases in which diagnoses made, after painstaking observation, have been materially modified by this maneuver or in which the therapy of the individual case has been directed along new lines." "Considering," Hansemann says, "still further, the anatomic relations of the cerebral and spinal membranes and the complication of conditions, a positive find may be of value for diagnosis. A negative result justifies no conclusions. To depend upon lumbar puncture for a hurried differential diagnosis of a purulent meningitis may become impossible, for in such a condition there may be no or only a few leucocytes in the lumbar fluid. If we decide the diagnostic worth of lumbar puncture we must remember that with hemorrhagic pachymeningitis, blood may be absent, that at times the fluid may be bloody from puncture of a vessel, that tuberculous meningitis may give fluid (*occasionally*) free of cells and even bacilli." Hansemann further says, "In general, I believe that lumbar puncture is more a method for the Clinical Institute than for use in general practice." We do learn the nature and micro-organic cause of cerebrospinal meningitis in the majority of cases by such procedure. We acknowledge the fact that the knowledge gained by lumbar puncture is not needed in all cases of cerebrospinal meningitis. It becomes important whenever, for the protection of the masses, the true cause of the disease demands demonstrations, or whenever the positive differential diagnosis during the life of the patient depends upon the information which it alone can give. Negative results will continue disappointing. Positive finds, when needed, prove exceedingly satisfactory. Netter has gone so far as to hold, as a result of his observations, that two conditions are necessary for the positive diagnosis of epidemic cerebrospinal meningitis: (1) The Kernig sign; (2) lumbar puncture and the presence of the disease-producing organism.

If, as Councilman and Eichhorst claim, so-called sporadic cases become foci from which epidemic cerebrospinal meningitis may spread, the knowledge gained by the thorough bacteriological study of the individual case may be the means of protecting entire communities against the ravages of this disease. Lumbar puncture is not a procedure for the novice or the careless. It demands skill, cleanliness and judgment, as well as infinite patience. The clinician needs the aid of the bacteriologist in his practice. Such helpmates are being supplied in all parts of our State as promptly as they are demanded by the intelligence and scientific spirit of the profession.

With either sporadic or epidemic cerebrospinal meningitis mixed infection is not uncommon; occasionally the pneumococcus may be found with the Friedländer bacillus and the meningococcus may have abundant companionship before death or recovery.

1. *The pneumococcus as certainly causes cerebrospinal meningitis as it does malignant endocarditis, and both of these fatal infections without pulmonary inflammation.* The infection is malignant, the clinical picture is characteristic; cerebral, spinal and peripheral symptoms are abundant. Early death is the rule. These cases are less frequent than are those associated with pneumonia.

2. *Cases of cerebrospinal meningitis with pneumonia* in Central New York have been uniformly fatal. It is exceedingly difficult to diagnosticate this complication in the majority of cases. Timely and frequent lumbar punctures offer aid which may prove conclusive. Nauwerck reports 17 cases each with post mortem, and adds 12

cases from the literature of this subject—29 in all. All of his patients were over twenty years of age. He calls attention to the latency of meningitis in pneumonia, recognized post mortem only, as a rule. Netter also mentions this latency, and Osler in his splendid Cavendish Lecture on cerebrospinal meningitis says, "Of the cases I saw in Montreal I remember but one in which the diagnosis was made during life." With opisthotonus, the Kernig sign, general rigidity and advancing pneumonia the mind has remained clear in some cases. This behavior, however, was exceptional. About one-half of the cases seen by the writer have presented no spinal symptoms. In other cases wild delirium with subsultus, strabismus, opisthotonus and the Kernig symptom have been followed by coma, high fever, rapid, irregular, small pulse and death. Repeated lumbar puncture in these cases is necessary to prove the presence of meningeal infection. The respiratory and circulatory symptoms may not be materially changed. The original leucocytic count may remain unchanged or slightly increased as meningitis develops. Pneumonias are repeatedly met in which cerebrospinal involvement is strongly suspected by the presence of many of the symptoms mentioned, in which no change in brain or cord are found post mortem. Especially difficult is the diagnosis of sporadic or epidemic cerebrospinal meningitis as a complication of alcoholic pneumonia in which there may have been pre-existing or accompanying wet brain with delirium, marked rigidity and general hyperesthesia. Meningococcus pneumonia may complicate cerebrospinal meningitis. Thus, Councilman, Mallory and Wright in the presence of both these conditions found the meningococcus present in eight of ten cases. In the other two the pneumococcus was found.

3. *Pneumococcus meningitis may follow distal infection.*

During the past ten years we have had three cases at St. Joseph's Hospital in which cerebrospinal meningitis of pneumococcus origin have followed. The first was after removal of the upper teeth, the second after otitis media, the third after a transverse fracture at the base of the brain. We have notes of two fatal cases of cerebrospinal meningitis which followed nasal operations, once after the removal of a nasal polyp, the second after removal of bony masses. Pneumococci were found in the nasal secretion. This was before the days of lumbar puncture. Besides the pneumococcus, *Streptococcus pyogenes, Staphylococcus pyogenes* and the influenza bacillus have been found with the meningococcus in the lumbar fluid and pus. Heubner reports 14 cases of tuberculous meningitis, in two of which he found with meningococci, tubercle bacilli. Fübringer reports a case of cerebrospinal meningitis dependent upon gonococcic infection. Pfuhl and Walter have called attention to the association of the Pfeiffer influenza bacillus with other meningitis producing germs, while Peucker, Donath and Wasserman call attention to cerebrospinal meningitis dependent upon the influenza bacillus alone. Wasserman's case was conclusive in proving the presence of the bacillus in the lumbar fluid. Saquepee and Peltier strengthened by their clinical and bacteriologic studies described a grippal form of cerebrospinal meningitis.

Symptoms due to complications are dependent upon extension of the primary or mixed infections or upon consecutive structural changes. These cannot be fully considered at this time. So numerous are these, and so far reaching their results, that chapters have been written in their consideration.

The consideration of the *differential diagnosis of conditions resembling cerebrospinal meningitis* is manifestly impossible within the time limit of this paper. Few errors will be made by the cautious who are willing to associate painstaking bedside examination with the knowledge gained from laboratory methods. These errors will be limited, if past experiences are repeated, to tuberculous meningitis, cerebral typhoid, the pneumonias, intestinal infections, rheumatism with cerebral symptoms and smallpox. The long prodromal period of tuberculous meningitis, the absence of leucocytosis in the majority of cases, the paralyses in the domain of the third, fourth and seventh nerves with other basilar symptoms, the absence of other cases and the knowledge gained by lumbar puncture will brand the case as one of tuberculous meningitis. The greater rigidity and opisthotonos will always be found associated with cerebrospinal meningitis. The differentiation of malignant scarlatina in foudroyant cases will continue speculative. The differentiation of smallpox will not puzzle long. Osler reports once such failure. The presence in variola of mononuclear lymphocytosis with the assistance gained from lumbar puncture, the Kernig sign and the characteristic umbilication of the vesicle will suffice in most cases.

An interesting experience which I have recently had with Dr. Randall, of Liverpool, brings to my mind a series of typhoid cases in which the symptoms during the first four to seven days are those of cerebral or cerebrospinal fever. The case to which I refer was that of a young man over twenty years who, during the first week of typhoid, had with delirium, opisthotonos, the Kernig symptom, rigid muscles and violent headache, cutaneous and general hyperesthesia with cerebral macule, no diarrhea but retracted abdomen, temperature 103° F., pulse 120, respirations 24. On the sixth or seventh day the Widal agglutination was positive. With that day ended the symptoms of cerebrospinal involvement. Another similar case, that of a child, aged only seven months, was seen with the late Dr. Winslow, of Ithaca, four years ago. During the first week of the disease the diagnosis of cerebrospinal meningitis seemed justified because of the usual symptoms of that disease. By the seventh day the

spleen became palpable and enlarged. Abundant roseola with a crop of sudaminæ covered the abdomen. The position of the child in bed was that of cerebrospinal meningitis. The Widal agglutination was positive on the tenth day. After this all evidences of cerebrospinal meningitis faded, the babe merged into the usual typhoid condition which was followed by a slow convalescence without sequel. The child was infected from the mother's breast. The latter had a mild ambulatory typhoid, unrecognized until a positive Widal reaction was found during the child's illness.

Cases of typhoid fever in which the first week simulates cerebrospinal meningitis are extremely difficult of recognition. Others have called attention to these anomalous forms of typhoid. Thus Curschmann, in 1886, reported five similar cases from which he concluded, "that it is surprising to find a condition scarcely mentioned in medical literature in which with a final characteristic course of abdominal typhoid the disease begins with all of the symptoms of a true cerebrospinal irritation which disappears after the first week of the disease." A search of medical literature shows that Fritz, a French physician, called attention to these cases in 1864 and proved that none of them showed change in the brain or cord on post-mortem examination. Stäubli reports three cases and makes a plea for the classification of these as meningismus typhosus or typhoid without lesions of spinal or cerebral meningitis but with all of these symptoms during the early days. Typhoid toxins must be charged with producing this mimicry of true meningitis. The longer period of prodromal symptoms, the greater enlargement of the spleen, the greater likelihood of intestinal manifestations, the absence of leucocytosis, the sterile lumbar fluid, the Widal agglutination, all strengthen the suspicion of typhoid.

That there are occasional cases of cerebrospinal meningitis dependent upon typhoid infection cannot be safely denied. My own experience offers no pathologic data to prove the truth of this statement. König reports two cases with normal pressure, demonstrated by lumbar puncture, one recovery and one death. In the first he diagnosticated edema and profound congestion; in the second the post mortem confirmed the association of the two diseases. Both pathologists and clinicians are disagreed on the ability of the typhoid bacillus to produce suppurative changes. Moring's conclusions during the Crimean War, in 200 typhoid autopsies with microscopic sections, in which there had been profound cerebrospinal symptoms, never showed the presence of suppurative changes in exudation or pus corpuscles. Holscher in 2,000 typhoid autopsies found 11 cases, *i.e.*, five per cent. with suppurative meningitis. Murchison denied the possibility of pus formation associated with acute typhoid inflammation, referring probably to extra-intestinal lesions. I might cite a large number of authorities (quoted by Stäubli) proving beyond peradventure the occasional association of cerebrospinal meningitis with typhoid in which the typhoid bacillus was the only pathogenic organism present, found in the lumbar fluid and post mortem. The last of these comes from the Munich clinic and is reported by Stäubli. His methods included all possible ante-mortem and post-mortem refinements of diagnosis and demonstrate the fact that the typhoid bacillus may cause purulent cerebrospinal meningitis. The splendid illustration of the article adds to its value and makes it convincing. There is no time during an active typhoid in which symptoms of deep involvement of the cerebrospinal system may not develop. To determine whether these have a foundation in pathologic change in the cerebral or spinal membranes will often prove exceedingly puzzling.

EYE SYMPTOMS OF CEREBROSPINAL MENINGITIS.*

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The eye symptoms of cerebrospinal meningitis may, for the convenience of consideration, be divided into two groups—motor and visual. Besides these two main groups, there is frequently present a conjunctivitis, which at times is attended with marked swelling and edema of the lids.

As is well known, the eye symptoms in cerebrospinal meningitis vary in different epidemics. For instance, one epidemic may be marked simply by a conjunctivitis of a more or less severe character;[1] in another the chief eye symptoms may be a plastic or suppurative choroiditis;[2] in another the cornea may be the seat of affection;[3] while in another the optic nerve and retina may be the chief points of trouble.[4] Nystagmus is frequent in some epidemics.[5]

In my experience as attending ophthalmic surgeon to the Babies' Wards at the Post-Graduate Hospital I have examined the eyes in from ten to fifteen cases of sporadic cerebrospinal meningitis every year, and I may say that the eye symptoms vary as widely in these cases as in the different epidemics. In some there were no eye symptoms whatever, in others only a mild conjunctivitis, while in others neuroretinitis, iridochoroiditis, keratitis, or various disturbances of motility, singly or in combination, have been present. Last year—1904—late into the winter and extending into the spring months, we had an epidemic of cerebrospinal meningitis in New York City, and I had the opportunity of examining some thirty odd cases during the year. Thirty-one cases in all were examined by me, some once and some many times.

Since all epidemics of cerebrospinal meningitis have one or more eye symptoms in common, I shall first consider any and all of the eye symptoms that may occur in epidemic meningitis, and

* Read at New York State Medical Society, Albany, January, 1905.

then give a detailed account of the eye symptoms observed by me in the epidemics of 1904 in New York City.

MOTOR SYMPTOMS.

These may be paralysis of the third nerve, sixth nerve, fourth nerve, ophthalmic division of the fifth nerve, seventh nerve, in all of which the paralysis may be partial or complete from pressure on the nerve trunks. We also have conjugate deviations, nystagmus and ptosis, from cortex lesions.

Paralysis of the Sixth and Third Nerve.—Paralysis of the sixth nerve is one of the most common of the motor lesions occurring in epidemic meningitis. In an epidemic of twenty-nine cases observed by Leichtenstern, the external rectus was affected oftener than the other eye muscles. And such was the case in the patients observed by me in the epidemic of 1904 in New York City. Randolph, on the other hand, in an epidemic of forty cases, reported third nerve paralysis in eight cases, every strabismus being of the divergent variety.

Pupillary symptoms, as dilatation, contraction, and inequality, are common, and are due to affections of the third nerve, the sympathetic nerve; or indirectly to inflammation of the iris and choroid, the retina and optic nerve and optic tracts. In the early stages of the disease we are liable to have contraction or inequality of the pupils, at times accompanied with a squint. In the later stages of the disease we often have dilatation and sluggishness of the pupils. Where iridochoroiditis is a complication the pupil is contracted and irregular, and the iris may be ballooned forward, the pupillary margin coming almost in contact with the posterior surface of the cornea, as in a case I now have under observation.

Seventh Nerve Paralysis.—From pressure on the seventh nerve we may have the condition of lagophthalmos, that is, the eyes remain half open, the patient being unable to close the eyelids. The cornea thus left exposed may, and often does, become ulcerated. In such cases the cornea should be protected by frequent applications of vaseline and the application of a protective bandage.

Paralysis of the Fifth Nerve, Ophthalmic Division.—From pressure on the fifth nerve anesthesia of the cornea and a neuroparalytic keratitis may develop. On the other hand, from irritation of the fifth nerve, we may have paresthesia, or even a hyperesthesia of the eyeball and lids, and a headache confined to the temple on the side affected.

Fourth Nerve Paralysis.—This is a very infrequent symptom, but has been noted in a few cases.

Ptosis.—Ptosis, unilateral or bilateral, is observed now and then in these cases. Unilateral ptosis, as the only focal symptom, occurs in cortical lesions alone. Not infrequently ptosis, single or double, occurs temporarily as a secondary symptom.

Conjugate Deviations.—Conjugate deviations of the eyes are sometimes met with in epidemic meningitis, but it is usually a secondary symptom, and is of short duration. It may be due to lesion in the cortex or in the pons. If the former, the deviation is toward the side with the lesion in paralysis, and from it in spasms; just the reverse of this happens when the deviation is due to a lesion in the pons.

Nystagmus.—Nystagmus is a frequent symptom in some epidemics, as in the one observed by Leichtenstern, while in others it is a rare occurrence or not present at all.

VISUAL SYMPTOMS.

Optic Neuritis.—Inflammation of the optic nerve occurs comparatively frequently in some epidemics and very rarely in others. Randolph found it in six cases of forty examined by him, and "great venous engorgement and tortuosity, with more or less congestion of the optic disk," in nineteen others, besides one case of hemorrhagic retinitis and thrombus of the central vein of the retina. Optic neuritis usually occurs late in the disease, but has been observed as early as the sixth day. When it does occur, and early in the disease, it is of vast importance in establishing the diagnosis.

Neuroretinitis and Perineuritis.—The retina as well as the optic nerve may become involved, the condition being termed neuroretinitis; or, if the retina is the chief seat of trouble, as in cases described by Galezowski, it may be more correctly designated as perineuritis. So marked swelling of the optic nerve as to give rise to *choked disk* is rarely seen in this disease. It is more commonly met with in tuberculous meningitis, and most often in brain abscess and tumors of the brain.

Optic neuritis in meningitis may be caused indirectly by pressure from exudation and cell infiltration on the outside of the nerve. However, the nerve and its sheath may be directly implicated by continuity of tissue. The optic disk has a more or less characteristic appearance in these cases, which is a certain "smoky" or "misty" appearance. In addition to this smoky condition the edges of the disk are indistinct or obscured altogether, there is more or less redness, and, at times, hemorrhagic spots on the disk. Many times there is only a decided congestion of the disk, while the retinal veins are large, tortuous and full of dark blood. The condition described and designated by Galezowski as perineuritis is characterized by a slight swelling at the periphery of the optic disk, a sinking in at its center and a moderate amount of redness, the retina presenting a striated appearance, or at times an edematous look. I have seen two such cases myself, and consider the condition to be simply a neuroretinitis.

Optic Atrophy.—This may be secondary, the result of optic neuritis; or it may be of a primary nature and descending. Primary atrophy of the optic nerve in cerebrospinal meningitis is uncommon, but I have one such case under ob-

servation at present. Dr. C. S. Bull reported such a case at the New York Ophthalmological Society this winter.

A marked peculiarity in optic atrophy following meningitis is that vision is restored in some of these cases although a white atrophy remains. Williams[7] and Randolph[4] have each reported a case where the patient was entirely blind, but subsequently recovered vision completely; in Williams' case the patient was deaf as well as blind, but the hearing was restored also. In neither of these cases it is distinctly stated that an optic atrophy is present, but we are led to infer this from the report of the cases. Dr. H. Knapp reported such a case at the Section of Ophthalmology, Academy of Medicine, December 10, 1904. In this patient, a young adult, there was complete white atrophy in each eye following meningitis, but, strange to say, vision was perfect in one eye and absolutely destroyed in the other. Knapp said he could not explain why vision should be present in either eye, and told the patient, in looking into his eyes with the ophthalmoscope, according to all rules, he ought to be blind.

Plastic and Suppurative Choroiditis.—Suppurative choroiditis with iritis and occlusion of the pupil, accompanied in some cases with pus in the anterior chamber, is the chief eye symptom in some epidemics. Plastic choroiditis usually appears in the second or third week of the disease, and, as a rule, causes total destruction of sight. The fundus of the eye, from the exudate in the vitreous, gives a grayish or yellowish reflex simulating the appearance of glioma retinæ. J. H. Knapp[2] and Joseph Jacoby,[6] among others, have noted this particular complication. In an epidemic at Rastadt, near Heidelberg, J. H. Knapp saw ten such cases. In most of these cases there was but slight irritation of the eye, there being only a mild subconjunctival injection present, with some discoloration of the iris and synechiæ. The patients frequently complained of slight pain in the head and eyes. In a few of the cases there were marked inflammatory symptoms,—swelling of the eyelids, intense redness of the eyeball and pus in the anterior chamber. The disease, as a rule, manifested itself in the second or third week of the meningitis and lasted from one week to a month or more, and left the eye soft and without sight.

Panophthalmitis.—This formidable condition, fortunately, rarely occurs as a complication of epidemic meningitis. The sight is always lost in the affected eye.

Photophobia.—This is an early and almost constant symptom of epidemic meningitis.

Conjunctivitis.—Conjunctivitis is a very common symptom of cerebrospinal meningitis, and in some epidemics is the only eye symptom noted. It usually appears early in the disease, as a rule is of a mild type, but may be very severe, with redness and swelling of the lids.

The edema of the conjunctiva in these cases is due to the extension of the inflammation into the orbit along the veins which impedes the return flow of blood.

Keratitis.—Keratitis of the parenchymatous type is a very serious complication in this disease. Niemyer and Wilson have observed such cases; and the latter reports five cases with blindness as a result in every case. Apparently, in epidemics where the conjunctiva is severely inflamed the cornea is more likely to be involved, either in an ulcerative process or with the deeper perinchymatous inflammation. With involvement of the fifth nerve we may get a neuroparalytic inflammation of the cornea—that is, of a trophic nature. When the seventh nerve is involved we are liable to have ulcerated keratitis as the result of the exposure of the cornea, as the patient is unable to close eyelids.

A few or many of the above eye symptoms may be present in epidemic meningitis; at times, however, no eye symptoms at all are to be observed. In the epidemic of cerebrospinal meningitis in New York City in 1904, in those cases observed by me, the most prominent symptom was that of *neuroretinitis*, which occurred in eight cases. In seven of these cases both eyes were affected, in the other case the right eye only. In one the neuroretinitis was complicated with markedly contracted pupils, in one with convergent squint and seventh nerve paralysis, and in one with conjunctivitis and keratitis. Four of these patients died, two were cured and two discharged before the end of the disease because of some complicating contagious disease, as measles, the patients being sent to some contagious hospital.

Conjunctivitis was present in eight cases. In every instance a smear was taken and a microscopical examination made. The Koch-Weeks' bacillus was found in two, staphylococcus in one, diplococcus in one, both staphylococcus and diplococcus in one, pneumococcus in one, gonococcus in one, and in one the examination proved negative as regards the eye, although the lumbar puncture proved positive as to the diplococcus of meningitis. One case was complicated with convergent squint, one with dilated pupils and one with keratitis and neurotinitis. Four patients died, two were cured, and two discharged before the close of the disease. In none of the cases except in the one with the gonococcus infection, was the conjunctivitis of a severe nature.

Pupillary Changes.—In three cases the pupils were affected; in one the pupils were very small with a mild neuroretinitis complicating; in one the pupils were dilated, a conjunctivitis complicating; in one the pupils were unequal; in this case no fundus examination was made, the parents taking the child away. In both cases which remained death resulted.

Venous Congestion of the Fundus.—In two cases there was marked dilatation and tortuosity of the retinal veins, while the optic disks were greatly congested, but without swelling. There were no other eye symptoms; one patient died and one recovered.

Paralysis of the Ocular Muscles.—Two patients had convergent strabismus, one of which was complicated with conjunctivitis and the other with seventh nerve paralysis and neuroretinitis; both patients recovered with good vision.

Keratitis.—This was present in one case, complicated with conjunctivitis and neuroretinitis; the patient died.

Iridochoroiditis, Primary Optic Atrophy.—This very interesting case is still under observation and warrants a brief description: M. R., aged two and one-half years, gave the following history: December 26, 1904, two weeks ago, complained of being tired, developed a fever and was very drowsy for a week; complained of pain in the head, and had cried a great deal in the last week. December 27, first examination; right pupil contracted and irresponsive to light or convergence; no redness of the eye or lids, while there is a grayish-white reflex from the fundus by oblique illumination. Left eye normal. Ordered atropine instilled in the right eye several times. December 28, right pupil has not responded to the atropine, the iris is bound down to the anterior capsule of the lens. Tension, —2. January 4, 1905, right eye, pupillary margin of the iris is bulged forward, half-way filling the anterior chamber. Tension, —3; slight subconjunctival injection; still a grayish-white reflex from the fundus. Left eye normal. January 11, 1905, right eye—the pupillary margin of the iris is almost in contact with the posterior surface of the cornea. The eye is very soft, but there is only slight congstion. The optic disk in the left eye is pale, the pupil slightly dilated and sluggish. January 25, 1905, right eye is in about the same condition as last noted; in the left eye there is decided paleness of the disk, pupil dilated and sluggish. The child is improving as to general symptoms. Pulse and temperature both markedly improved.

The Significance of Eye Symptoms in Epidemic Cerebrospinal Meningitis as Regards Diagnosis and Prognosis.—The diagnosis in epidemic meningitis, as a rule, may be made from the general symptoms, *e.g.*, vomiting, irregular temperature, headache, retracted head, spinal irritation, petechial or herpetic eruptions, which, taken together with lumbar puncture and Kernig's symptoms, make the diagnosis positive. But in a few cases the general symptoms are not well marked, when the eye symptoms, especially where there are changes in the fundus, may serve to clear up the diagnosis. Inequality of the pupils, particularly if accompanied with squint, should place the general practitioner on his guard. I am not unmindful of the difficulty and, at times, the impossibility of making a satisfactory examination of the fundus of the eye in children; but as many of the symptoms in meningitis are motor in character, that is, paralysis of the different eye muscles, pupillary changes, ptosis, etc., all of which may be observed without the use of the ophthalmoscope, ignorance of the use of which instrument most practitioners give as an excuse for not making proper examination of the eyes, it is the more to be regretted that the eyes do not receive earlier and more careful attention. I may state here that since the introduction of the electric ophthalmoscope in the last few years the examination of the fundus of the eye can be made easily while the child lies in bed, and even by one not experienced in the use of the ophthalmoscope. The light in these instruments always moves with the instrument, and it is an easy matter to keep the fundus of the eye illuminated, especially where the pupil is dilated either with atropine or from the effects of the disease.

Prognosis in these cases where there are eye lesions, especially where the fundus is affected, is always more grave than in those cases where there are no eye symptoms. In the epidemic observed by Randolph,[4] in the six cases where optic neuritis was a complication five died, while in the other case the patient was alive when last heard from. In other words, in the five cases followed to a conclusion every one died, or 100 per cent. In the cases were there were no fundus lesions 57 per cent. died. In the epidemic observed by myself, of the eight cases affected with neuroretinitis, four died, two were cured, and two discharged (not followed to a conclusion), making the percentage of deaths equal to 66⅔ per cent., while in the ten cases where there were no eye symptoms there were but 50 per cent. of deaths. Such statistics speak for themselves and need no comment.

REFERENCES.

1 Ziemssen and Hess. Klin. Monatsblatt für Augenheilkunde, 1685, p. 275 et seq.
2 J. H. Knapp, Centralbl. f. med. Wissenschaften, No. 33, 1865.
3 Wilson. Dublin Quart. Jour. Med., Vol. XLIII, 1867, pp. 302-6.
4 Randolph. The Johns Hopkins Hospt. Bulletin, No. 32.
5 Leichtenstern. Deutsch. med. Wochen., No. 31, 1885.
6 Archiv f. Ophthal., Bd. XI, 3, S. 165.
7 Weekly Med. Review, Vol. 9, p. 416, 1884.

MEDICAL PROGRESS.

SURGERY.

On Peritoneal Adhesions.—Carl Beck (*Am. Med.*, April 1, 1905) says the study of the adhesions forming after repeated attacks of appendicitis has also given us clearer insight into adhesion formations in general, revealing many obscure ailments in their true light. Adhesions are found more frequently in the ileocecal region than anywhere else. As a rule there is a broad parietal adhesion especially if there is postoperative hernia. The peristalsis of the free part of the gut elongates it until it becomes a tense, unyielding band; and if an intestinal loop becomes ensnared below it, its circulation will be under pressure, and will give rise to more or less disturbance, sometimes even to complete strangulation, especially if there is procrastination. After early operation postoperative adhesions are rarely found; another point in favor of prompt early surgical interference in appendicitis. Beck's experience in cases of chronic progressive adhesion-forming peritonitis, as observed idiopathically as well as after appendicitis, is absolutely bad. The nature of this peculiar condi-

tion, characterized by a multitude of cobweb-shaped bands, is not yet sufficiently elucidated.

Epiphyseal Separation.—In summarizing separation of the epiphyses Kirmisson (*La Méd. Mod.*, March 8, 1905) states that in general fractures and luxations are less grave in children than in adults, but fractures of the elbow are very important in the young. Fractures of the forearm in children are usually greenstick, because the bones are more elastic and the periosteum thicker than in adults. Here the characteristic deformity is a posterior convexity of the forearm with no abnormal mobility or crepitus, while fractures of the clavicle are shown only by ecchymosis and pain on pressure. Instead of fracture of the fibrils and tibia, which are so frequent in adults, we meet with fracture of the femoral diaphysis in children, which heal easily under extension without shortening. Fracture of the neck of the femur in children is not so uncommon as was formerly supposed. Dislocation of the hip is occasionally seen in children, but more often dislocation of the elbow. On speaking of epiphyseal separations it must be remembered that between ten and thirteen years the diaphysis and epiphysis are two bony parts separated by the epiphyseal cartilage. These separations, which between seven and fourteen years are not the result of a direct force or of traction, but are caused by twisting and are accompanied by a large tear of the periosteum. The break in continuity, as shown by the X-ray, usually comes between the diaphysis and epiphyseal cartilage with sometimes a slight fracture of the diaphysis. These epiphyseal saparations are particularly difficult from the point of view of diagnosis and treatment, as they are so near the joints. At the upper extremity of the humerus one must be careful to distinguish dislocation of the shoulder, and the upper fragment is so small that it is very hard to reduce. Besides the periosteum may be so torn that reduction is impossible without incision. Laceration of vessels and nerves is most frequent in separations at the lower end of the femur when amputation may be necessary. There are two ways of reducing the dislocation: (1) To use traction and reduce in extension; (2) pass the left arm under the thigh and draw the leg down with the right hand flexing at the same time. The second is usually the more successful. If the periosteum has been button-holed by the epiphysis an incision may allow reduction, otherwise resection must be done, which necessarily entails a subsequent shortening of the leg.

Gunshot Wounds in the Present War.—In view of the present Russo-Japanese conflict H. K. Cholin's article in *Roussky Vrach*, February 18, 1905, presents some some special interesting features. The Japanese use a rifle of their own invention, and a bullet of a larger size than the Russians. In rapidity of its flight it also excels the enemy's bullet. The penetrating wound caused by it heals very well; it is, however, when the bullet impinges upon and into the tissues that it produces a terribly devastating effect; there is a general tearing and bruising of tissues accompanied usually by a profuse and often alarming hemorrhage. The directness and the rapidity of the bullet's flight are such that no tissues can withstand the impaction, or in any way deviate its course. The wound is usually so cleanly incised that no pieces of clothing are ever carried in—an element of great importance in the favorable healing of such wounds. The bone is rarely splintered, except in cases where shrapnel is used. The blood vessels are very often wounded and the author observed several cases of aneurism of the popliteal as well as of other arteries. Many of the nerve trunks are attacked. The wounds usually healed kindly and without reaction, but meddlesome examinations were sure to react on the course of healing unfavorably. Pus appeared only in those cases where the tissues around the path of the bullet were invaded. Another complication was the frequently large cicatrices and tough adhesions. Out of 230 gunshot wounds 13 were cranial, 11 through the substance of the brain. The deep penetrating lesions in this region were not accompanied by any destruction of the bones of the skull; this was observed only in the superficial wounds. Six of the cases were accompanied by paralysis of the arm and leg, one presented the symptoms of cortical epilepsy due evidently to pressure and removed by operation. The general results of wounds of the lungs were rather favorable; all of them, with one exception, being penetrating. There was hemoptysis in 21, subcutaneous emphysema in three, extensive hematothorax in one, etc. The 27 cases of abdominal trauma were all penetrating wounds; of these only one died of what the author thinks was neglect of treatment; but one case of peritonisis, and that was favorable. There were several penetrating wounds of the liver, spleen and kidneys. The injuries to the joints were usually severe and rebellious to treatment, but there was but one that required operative inferference. From the foregoing, the author draws the following conclusions: (1) The Japanese bullet meets all the requirements of humanitarian warfare, and the wounds inflicted by it heal rapidly and without reaction. (2) The majority of wounds especially those in the region of the skull, abdomen and spinal column require prolonged treatment on the battlefield. It thus becomes imperative to organize hospitals in the immediate proximity of the field of action, so as to obviate the necessity of transportation that is usually attended by terrible suffering. (3) The possibility of late complications demands prolonged sojourn of the wounded at the hospital. (4) The present conditions of transportation are absolutely inadequate and demand immediate attention.

Fracture of the Patella.—In a very extensive article in which the foremost authorities are quoted, W. C. Jones (*Chic. Med. Rec.*, March 15, 1905) summarizes the main points in the anatomy, etiology, pathology, diagnosis and treatment, as follows: In regard to the anatomy of the knee, the following are pertinent facts: (*a*) The oblique direction downward and inward of the superior border of the patella; (*b*) the position of the patella in relation to the femur, the center of the former resting on the edge of the condyles of the femur when the leg is in the position of semiflexion; (*c*) the insertion of the quadriceps tendon on the anterior portion of the patella; (*d*) the inseparable connection of the patella anteriorly with the patellar aponeurosis, posteriorly with the synovial membrane of the knee-joint, and laterally with the lateral and capsular ligaments of the joints. There is practical unanimity of opinion in regard to all forms of fracture of the patella, except recent simple transverse. The following features of this type deserve mention in this connection: (1) As to the etiology, this fracture is caused by contraction of the quadriceps extensor muscle, which breaks the bone over the lower edge of the femur. A fall upon the knee may be a simultaneous con-

tributing factor. (2) In the pathology, the following lesions are particularly significant: (*a*) The laceration of the fibro-aponeurotic tissues about the joint; (*b*) the anterior V-displacement of the fragments or the possible rotation of one of them; (*c*) the interposition of blood and, in most cases, of aponeurotic structures between the fractured ends. (3) The diagnosis of this fracture includes not only the mere discovery of the presence of a fracture, but also the determining of the position of the fragments and the extent of the injuries to the soft parts. (4) In regard to the treatment, the tendency is decidedly in favor of operative rather than non-operative measures; and the open methods usually are preferred to the subcutaneous ones. The indications for operation are, wide separation of the fragments, interposition of soft tissues between the fractured ends, marked swelling of the joint, and the fact that the patient follows an arduous occupation. The operation must be undertaken only by experienced men and only under conditions where the asepsis can be completely controlled. The patient must be in good health and of suitable age. It is preferable to avoid, if possible, suture of the bone, uniting only the aponeurotic structures. If, however, the bone is sutured, use absorbable material. Begin massage during the first week and passive motion at the end of the second week.

Penetrating Wounds of the Abdomen.—Of the two cases reported by GLICKMAN (*Prakt. Vrach*, February 11, 1905), one was a man of twenty-six years of age, in whom there was a protrusion of the intestines through the wound; there was a wound in the protruded intestine 4 cm. long. The organs were replaced and the abdominal wall closed with sutures; the postoperative course uneventful, the patient leaving the hospital cured two weeks after the occurrence of the accident. In the other case there was a protrusion of the pancreas. This was first resected, then rendered thoroughly aseptic and replaced. As in the first case the postoperative course uneventful. The author inclines to the view that in cases of protrusion of the pancreas the protruded portion should always be resected, especially if there be even the remotest possibility of infection; and in the pancreas this may always be expected. In a general way the author thinks that only in the very recent cases where absolute asepsis can be guaranteed may the protruded organs be replaced in its entirety. In Closing small abdominal wounds the author does not include the parietal wall of the peritoneum; it is only in wounds of great extent that such inclusion becomes necessary. In treating penetrating wounds of the abdomen it is more advisable not to close them tightly, but to leave a corner for the introduction of iodoform or sterilized gauze. The prognosis of such wounds is more favorable at the present time than it used to be formerly, the more so with cases that are taken in hand early enough.

MEDICINE.

Acute Meningitis.—W. T. COUNCILMAN (*Jour. A. M. A.*, April 1, 1905) describes the conditions of acute meningitis with more special reference to that form produced by the *Diplococcus intracellularis meningitidis*, which he believes is constantly occurring in a sporadic form, aside from the not infrequent epidemic aggravations. The infecting organism, he states, is one of low vitality and incapable of a purely saprophytic existence. The statistics fail to give any adequate idea of the frequency of the infection in ordinary years. His experience, however, leads him to believe that with rare exceptions all cases of primary meningitis are due to this micro-organism and that it would be impossible without sporadic infections to bridge over the intervals between the epidemics. It is possible, too, that the germ may even inhabit the normal mucous membranes, of the nose, for example, as has been shown in a few cases, where it it produces a rhinitis, and infection of the meninges may take place through the lymphatics or by continuity of surface. We can only explain the epidemics of the disease, he says, either by an increase of virulence of the diplococcus or by a decrease in the resistance of the tissues. The underlying causes of epidemics are unknown, and even atmospheric conditions cannot be excluded. He discusses to some extent the relations of meningitis to pneumonia, as shown by the Massachusetts health statistics, and illustrates with a chart. Primary meningitis from the pneumococcus or staphylococcus is rare; secondary types are not so frequent. The paper concludes with a description of the pathologic conditions in acute meningeal disease.

The Panama Canal Mismanagement.—In the *Jour. A. M. A.*, April 1, 1905, the Isthmian Canal Commission replies at length to the charges made against it by Dr. C. A. L. REED, in the *Journal A. M. A.*, March 11. The commission states that neither from official conferences nor from interviews with members of the sanitary staff has it been learned that the plan of sanitation is defective in scope or in elasticity, or that any troubles have occurred, except such as inevitably attend the organization of such enterprises. Dr. Reed was asked for a reply to go in the same issue of the *Journal*, but he reserves his reply for the ear of the Secretary of War, because he has been criticized for allowing publication of his first report without waiting for government approval of its publication. The *Journal*, however, expresses the conviction that Dr. Reed has made out a case. In some details he may have been misinformed, but even the reply of the commission itself proves, by the admissions made therein, that the sanitary department was very unwisely subordinated to, and hindered by, various officials and red tape methods. This was the main contention, and against this the *Journal A. M. A.* and many other medical journals protested before the commission was formed.

Typhoid Perforation.—MORRIS MANGES, New York City (*Jour. A. M. A.*, March —), reports nineteen cases of perforation in typhoid, with sixteen operations and five recoveries. He discusses the subject generally, but emphasizes particularly the diagnostic significance of pain, which under certain conditions in this disease may accompany non-perforative peritonitis. He considers that the most important facts in the diagnosis are the marked change in the patient's condition with the abdominal pain, which is very variable, and that the other abdominal conditions, distension, rigidity, tenderness, liver dulness, etc., with the anxious facies and sweating, are valuable aids in the diagnosis. Changes in the rate and character of the pulse are of more value than temperature or respiration. Manges believes in the occasional spontaneous cure of this condition, and refers to one case in his series in which this apparently occurred, and to another, in which, at the autopsy, a small perforation was found well sealed by omentum. The rule to operate, however, is not vitiated by these rare occurrences, and operation itself does not add to the dangers and may be effective in preventing a perforation where one is not found.

Rapid Bacteriological Diagnosis of Diphtheria.—H. A. HIGLEY (*Med. Rec.*, April 1, 1905) says that by the following method it is possible to make a rapid

(fifteen-minute) and sure diagnosis by the examination of stained smears made directly from deposits or false membranes in cases which present themselves for differential diagnosis of diphtheria. The material from which the smear is made is obtained by passing lightly over the false membrane a sort of curette formed from a wire-looped needle flattened by filing at its curved extremity. The following staining fluids, which should be freshly prepared, are used: No. 1. Five drops of Kühnes carbolic methylene blue in seven cubic centimeters of tap water. No. 2. Ten drops of carbol-fuchsin in seven cubic centimeters of tap water. Method of Application.—(1) Fix smear by passing three times through the flame; (2) apply tain No. 1 for five seconds; (3) wash with tap water and dry with filter paper; (4) apply stain No. 2 for one minute; (5) wash, dry and mount in balsam. When thus stained, the diphtheria bacilli appear as dark red or violet rods, irregularly stained, often containing polar dots. The unevenness of their contour and mode of division are regularly and distinctly brought out, and these characteristics afford the essential differential points, for other micro-organisms take varying tints, and may appear of the same color as the diphtheria bacilli, so that upon color alone no differentiation is possible.

Relation of the Nervous System to Visceral and Trophic Pneuomena.—J. Fraenkel's address (*Med. Rec.*, April 1, 1905) is devoted to a consideration of the relation of the nervous system to the pathology of the vegetative functions. So-called visceral or vegetative phenomena accompany more or less prominently organic disease of the nervous system, and constitute the chief physiognomy of all functional states and functional symptom-complexes. Trophic, vasomotor and secretory disturbances of the skin, changes in the trophism of joints and viscera, disturbances of the physiologic rhythm of vaso- and viscero-motor innervation, perversions of visceral sensation, are often seen at the bedside, and not sufficiently appreciated. The author takes up in turn the various manifestations of such changes occurring in the various organs and functions of the body, and points out their relations to the underlying disease. Thorough study of these subjects promises us, he says, (1) greater exactness of localization of organic disease of the nervous system and better interpretation of early symptoms; (2) more rational conception of functional conditions; (3) clearer, therapeutic indications.

Perineum, Perineorrhaphy and Prolapse.—A. Sturmdorf (*Med. Rec.*, April 1, 1905) says that the keynote in the clinical significance and therapeutic indication of pelvic floor laceration is prolapse, while perineorrhaphy, immediate, intermediate and late, represents respectively the prophylaxis and cure of such prolapse. The normal position of the uterus is maintained by deflection of the force of intra-abdominal pressure, which acts on the uterus, poised as a lever with unequal arms on a fulcrum formed by the intravaginal perineal crest. Restoration of the conditions resulting in injury to the perineum can best be repaired by immediate suture, and to facilitate accurate readjustment of original anatomic relations, the preliminary introduction of what may be termed guide sutures, will be found helpful, time-saving, and, to some extent, prophylactic. At some convenient moment, prior to the descent of the fetal presenting part, two to three silkworm sutures are introduced under proper precautions into the structures between vagina and rectum, from the cutaneous base of the perineum to its apex, which serve as efficient landmarks when the severed muscular and fascial layers are to be reunited after delivery. Late operations involve as their surgical objective point the remnants of the anterior loop of the levator ani muscle. Under all conditions of perineal rupture, the pubic attachments of this levator loop present permanent palpable ridges. With these ridges serving as guides to the muscle, the posterolateral mococutaneous junction of the vagina is severed and the deep seat of lesion exposed by carefully raising the cicatrized vaginal coverings. Utilizable remnants of the levator muscle can thus be readily located, and after isolation and trimming, should be coaptated by buried end-to-end sutures.

Treatment of Cerebrospinal Fever.—Charles G. Stockton (*Am. Med.*, April 1, 1905) emphasizes the importance of bringing about the best hygienic condition for the patient. This is accomplished by the absolute quiet in well-ventilated, darkened rooms, with the absence of all excitement and irritation. Giving the greatest attention to secure the proper performance of the various functions of the body. The trial of the hot baths after the method of Aufrecht in all cases in which they seem to do good. The practice of intraspinal puncture, with drainage when necessary to relieve severe pressure symptoms, to be repeated, if necessary, provided benefit follows the first puncture. The use of antipyrin in cases in which the temperature is raised not only for the relief of this symptom, but for the mitigation of headache and hyperesthesia. Dr. Stockton has found this drug also useful in improving the mental state, and in his hands it has not been followed by the expected depression. The use of opium or the bromides alone, or in connection with antipyrin, if necessary, for the relief of convulsions, pain, hyperesthesia and pressure symptoms generally, which are not relieved by the foregoing methods of treatment. The use of mercury when needed for its laxative effect, or when needed to assist in stimulating the organs of elimination opium and the bromides are indispensable in some cases and large doses are at times necessary.

Immunity.—Chapter X of this article in the *Journal of the American Medical Association*, April 1, 1905, deals with the Gruber-Widal reaction and its use in the diagnosis of typhoid fever. It is stated that it is largely a matter of accident that the reaction is called Widal instead of Grunbaum, as Grünbaum was carrying on the same work at the same time, but Widal preceded him in the publication of his more extensive work. It is stated that when a normal serum is found to have a high agglutinating power the previous infection by the micro-organism is to be thought of, and attention is called to the fact that the serum of a new-born child is devoid of many of the agglutins which are found in later life, hence, many of the so-called normal agglutinins may be acquired properties. The term immune agglutin is applied to the agglutinating substance of a serum when the property has developed as a result of infection, or of systemic immunization of the organism. This chapter takes up the variations in agglutinogenic organisms and the variations in agglutinin. It is stated that the agglutinating power of the serum of a typhoid patient varies from day to day, and that it may be thirty times as strong one day as the next, or may even disappear for a day or two. The possibility of agglutinin being found in the serum of a child whose mother had had typhoid fever during pregnancy is discussed. The Pfeiffer reaction is considered and the technic of the agglutination test is described.

Gastric Cancer.—G. W. McCaskey (*Jour. A. M. A.*, April 1, 1905) points out that in the early diagnosis of malignant gastric disease there is no single symptom or analytic finding, the presence of which is diagnostic or its absence exclusive. The same is perhaps true of any combination of several symptoms, still the diagnostician

is not entirely at sea. A thorough study of each case as to the disturbed gastric function, its duration, development., etc., is essential. The external physical examination would be presumably negative. Examination of stomach contents before breakfast, both chemical and microscopic, may afford aid. The presence of lactic acid, of the Oppler-Boas bacillus, of gastric catarrh, or broken-down blood cells are all more or less significant. Then the digestive processes should be studied. The presence or absence of hydrochloric acid and its amount, if present, the intensity of the biuret reaction or its absence and the presence or absence of the various enzymes are salient points here. All these may strengthen or dispel suspicion, but the patient should be kept under critcal study and treatment, the therapeutic tests being of the utmost importance. McCaskey thinks that gastrectomy should be the operation of choice as affording a longer chance of life. If we are ever to get the better of gastric cancer it will be when the internist learns to suspect the condition early and has the courage to act on the suspicion before it becomes a certainty.

NEUROLOGY AND PSYCHIATRY.

The Pathology of Infantile Paralysis.—A histological study was made by F. E. BATTEN (*Brain*, Autumn, 1904), of sections of the spinal cord of three fatal cases of infantile spinal paralysis, from which the author draws the conclusion that this disease is due to a primary thrombosis of a branch or branches of the anterospinal artery supplying the gray matter of the anterior horn, that such thrombosis may be produced by many and various forms of infection, and the disease is not due to a special specific infection, that the condition is more likely to occur in the lumbar region owing to the blood supply of this portion of the cord being at a point most distal from the heart, and the long course of the reinforcing arteries.

A New Symptom in Hemiplegia.—A phenomenon which is not described in the text-books, has been observed in cases of hemiplegia by K. HEILBRONNER (*Deut. Ztsch. f. Nervenheilk.*, December 29, 1904). In recent cases of hemiplegia the inner and outer contours of the thigh broaden out, lessening the anteroposterior diameter. While the circumference of the thigh on the healthy side approaches closely the circumference of a circle, the circumference of the paralyzed side gives the impression of a flattened oval. This symptom is a constant one in recent cases of hemiplegia. It is not the result of the limp rolling outward of the lower limb, for it is observed if the limb is brought close up to the healthy member. This manifestation is also observed in other parts of the body, but on account of the lesser degree of muscularity it is not so prominent. This symptom is of diagnostic value only in case the lesion is unilateral in order that these may be a healthy limb for comparison. This prenomenon does not appear in normal sleep, in which muscular tone is preserved. Likewise in ordinary cases of loss of consciousness this symptom is lacking, and the same is true of deep narcosis. The symptom is present in severe cases of acute alcoholic polyneuritis, and in recent cases of acute anterior poliomyelitis. It is not a prominent manifestation in tabes dorsalis. In hysterical flaccid hemiplegia the symptom is not present. Of extremely practical importance from the diagnostic standpoint would be this symptom of "broad-leg," as it is termed, in cases of apoplectic coma, if it should be present at a time when every active or reactive muscular act is absent, and both extremities offer no resistance to passive motions. It is also of value in the differential diagnosis from hysterical paralysis.

Tumors of the Hypophysis Without Acromegaly.—That disease of the hypophysis does not necessarily cause acromegaly, is clearly indicated by the histories of the two cases reported by J. KOLLARITIS (*Deut. Ztsch. f. Nervenheilk*, December 29, 1905). The first case was that of a sixteen-year-old girl who contracted syphilis and six months later complained of severe pains in the head and neck, particularly at night. A few days later there occurred a right abducens paralysis, repeated vomiting and vertigo. The swollen glands showed that the system was no yet free of syphilis. An intensive mercurial treatment was instituted. In spite of this, to the above symptoms were added right-sided ptosis, and double abducens and oculomotor paralysis, whose intensity varied. On account of the severe pains .02 to .06 grams of morphine were administered daily. A month later there occurred attacks of convulsions with dyspnea and unconsciousness. These attacks were frequently repeated. Four months later there occurred paralysis of the right accessorius and of the right vocal cord; the sense of smell was also impaired. Tubercle bacilli were found in the sputum. The patient became weaker and complained of loss of vision. Two months later death occurred. Autopsy showed a sarcoma of the hypophysis in which no part was healthy. The first symptom of the disease occurred nine months before death. Besides its bearing on the question of acromegaly, this case showed that nocturnal headaches cannot serve as a diagnostic sign of lues as against tumor of the brain. The second case was that of a 28½-year-old woman who one year before her death complained of severe headaches at night, and a half year later suffered a diminution in vision and a paralysis of the left abducens. At first the fundus of the eye was normal but later there was observed a choking of the temporal border of the disk. The second branch of the left trigeminal nerve was affected with anesthesia dolorosa, which later disappeared. The area of innervation of the right trigeminal also became painful. Exophthalmos appeared. One year elapsed between the appearance of the first symptom and death. Acromegaly was at no time observed. Autopsy revealed an angiosarcoma affecting the entire hypophysis. The nocturnal headaches at first pointed to syphilis, but the mercurial treatment was of no avail.

Paralysis from Fright.—A case of paralysis from this cause in which the patient, a girl of sixteen years, sustained a complete loss of function in all four extremities, is reported by E. v. LEYDEN (*Berl. klin. Woch.*, February 20, 1904). Sixty hours after being badly frightened by an attempted burglary, the girl was suddenly deprived of motion and sensation in legs and arms, together with paralysis of the lower abdominal muscles and the sphincters of bladder and rectum. The latter recovered their tone within a few days, but the paralysis of the limbs lasted for about ten days. It must be assumed that in psychical, as well as in traumatic shock, the nerve impulses to and from the cerebral centers of motility and sensation, are interrupted. Examination showed that electric conductivity in the peripheral motor nerves was not interfered with, but that the transfer of sensory impulses to the motor paths could not be accomplished. The voluntary motor impulses was also present but could not be transmitted through the spinal ganglia to the peripheral motor nerves. The author is therefore of the opinion that we have to deal here with the cerebral as well as the spinal ganglion cells, which leads to an inhibition of the normal impulses in both the sensory and motor systems. The prognosis of these cases seems to be quite good and the treatment should

be psychical and stimulating, the latter consisting mainly of strong faradic currents sufficiently powerful to produce contractions and sensations in the affected limbs.

OBSTETRICS AND GYNECOLOGY.

Pregnancy and Labor in Primiparæ of Thirteen to Sixteen Years.—In a series of observations made in Buenos-Ayres, S. GACHE (*Ann. de Gynéc. et d'Obstet.*, December, 1904) one notes the extraordinary procreative ability of the women of that city, which starting with a precocious menstruation, is prolonged until the forty-fifth year. The occurrence of pregnancy in girls who have not yet menstruated indicates that there is no absolute correlation between ovulation and menstruation. From the thirteenth to the sixteenth year women are not more exposed than later to abortion or complication of pregnancy. Among 91 cases studied, there was only one contracted pelvis, from defect of development, and three cases of slightly had a good result. The accouchement of these minors was normal, with the exceptinon that the labor was longer than usual. There were 85 vertex presentations and five pelvic. Forceps was applied six times. Lesions of vagina, vulva and perineum were rare, and in all cases quickly healed. There were no cases of insertion of the placenta in the inferior segment of the uterus. The mean weight of the fetus was 3,039 grams (6.6 pounds). The proportion of sexes was nearly equal, being 44 boys to 45 girls.

Albuminuria and Nephritis of Pregnancy and Labor.—The problems of the relationship of pregnancy and labor to kidney changes has led R. W. STEWART (*Am. Jour. Obstet.*, January, 1905), to publish conclusions inferred from frequent analyses of the urine of five cases both before and after labor. The following facts may be noted by referring to the details of the cases: (1) In four cases of nephritis the kidney function was normal until within the week preceding delivery. (2) In four cases there was a marked increase in albumin from the time of its first appearance and a very decided increase in albumin leucocytes and casts immediately after delivery. (3) In two cases there was marked diminution in the quantity of the urine. (4) The ending of pregnancy was followed in a relatively short time by a cessation of all threatening symptoms. (5) With one exception, in all cases symptoms of renal insufficiency appeared before labor had set in. It is the prevalent belief among obstetricians that pregnancy is of itself responsible for kidney lesions. Against this speak the facts that in the great majority of cases there are no symptoms which point to a change in kidney function; that in most cases the albuminuria will disappear under medical treatment, pregnancy not being interfered with. If pregnancy were a potent cause in the production of albumin the examination of the urine should show a constant increase in the number of cases in which it would be found, the further the woman progressed in gestation. The writer's figures do not bear out any such assumption. In explanation of the facts observed in this series of cases the conclusion is offered that in cases of simple albuminuria the pressure of the enlarging uterus upon the intestines may produce sluggishness in peristalsis and consequent constipation; this in turn may cause retention of the products of decomposition, then subsequent absorption into the general system and thus additional work thrown upon the kidneys; the consequent effort on the part of the kidney to throw these products out of the system would in time produce hyperemia of these organs, kidney fag and hence albuminuria. In these cases normal function may be restored by unloading the intestines and the liver, in its severer forms, cases in which the intestines are neglected or digestion overtaxed, the persistent renal hyperemia may cause true nephritis. This theory would make the hepato- and auto-toxemias secondary factors and remove them from the category of primary causes.

Ovarian Cyst Containing Lumbricoides.—An unusual example of the migratory habits of the lumbricus, is reported by E. DUFOUR (*La Clinique*, March 4, 1905). The case was that of a seventeen-year-old girl who had never menstruated, and who a year before she came under observation by the author had been under hospital treatment for what had been diagnosed as tuberculous peritonitis, for which she had been discharged improved. Soon afterward a tumor appeared in the suprapubic region extending upward and to the right. It caused but little pain and a slight difficulty in urination. The latter was exaggerated one month before she entered the service of the author. A median laparotomy was performed, and there was found in the right of the pelvis a large encysted tumor, adherent to the surrounding parts and to the intestine, and presenting a number of cysts on its surface. The efforts to free the tumor from its adhesions revealed behind it a fungous tissue, and a cystic pocket on its surface, which contained a gelatinous liquid containing three living round worms. The examination of the intestinal loop to which the tumor had been adherent, revealed two minute perforations. The latter were sutured and the tumor was freed and removed. A part of the fungous tissue could not be extirpated. There was no sign of tuberculous peritonitis. The tumor was a multilocular cyst of the ovary. The fungous tissue was of an inflammatory nature. The patient made a good recovery with the exception that a fistula remained, which up to the present has resisted all efforts to make it heal.

PRESCRIPTION HINTS.

Sedative and Carminative.

℞ Dionini ..... gr. iii
Ol. Cajuput ..... m. iii
Chloroformi ..... } aa. m. xlvi
Ext. Cannab. ind. fld.... }
Tr. Galanga, or
Tr. Zingiberis ..... m. x
Acid. Hydrocyan. dil. ..... m. ix
Alcohol, ad. ..... ʒ ii

Sig.: 30 to 60 drops in water.—Jas B. Johnston.

Treatment of Flatulence.

℞ Peroxide of magnesium..... grs. vi

For one wafer to be taken half an hour before each meal.

After meals, the following powder:

℞ Prepared chalk..... grs. xv
Bicarb. of soda..... grs. viii
Calcined magnesia..... grs. viii

In case of burning sensation in the stomach and pyrosis:

℞ Prepared chalk..... grs. xv
Subnitrate of bismuth..... grs. vi
Calcined magnesia..... grs. xii
Codeine ..... gr. 1/6
Powdered belladonna..... gr. 1/3

For one powder.

Preparations of naphthol should be avoided, as they irritate the stomach.

Diarrhea of Consumptive Patients.

℞ Methylene blue..... grs. iii
Lactose ..... grs. xx

For one wafer, to be given daily.

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THE MILK IN THE ISTHMIAN COCOANUT.

The controversy that has lately arisen between Dr. Chas. A. L. Reed and the defunct Isthmian Commission is not only a very unfortunate one, but comes at a singularly inopportune time. With the merits of this dispute we have, at this time, nothing to do. It may be, as the Secretary of War claims, that Dr. Reed, who was sent to Panama as a member of a commission to condemn the land used for the construction of the canal, and was asked incidentally by Secretary Taft to give his ideas on sanitation derived from a personal view of the situation, rushed hastily into print before reporting to his superior officer. If such be the case, he has already been admonished by the letter of the President of the United States.

It may also be true on the other hand, as Dr. Reed insists, that bureau circumlocution and red tapeism, like the mills of the gods, grind slowly, and it must be admitted in the refusal of the Isthmian Commission to grant a small appropriation to Dr. Gorgas, to enable him to insure the appointment of a desired assistant, that they ground exceedingly small. But it is not the merits of the claims of either party in this unfortunate quarrel that is of the first importance to the medical profession at large, but the effect that these charges and countercharges, these "reports" and "answers" will have upon the laity and lay press, and through them upon Congress, in whose hands the key to the whole situation really lies.

Now, it must be borne in mind by every medical man that while the work of the last few years in tropical climates has been marked in success and brilliant beyond words in achievement, that the agency of the mosquito and its action in the propagation of yellow fever and malaria, while it has been accepted by them as a fact, is yet looked on with doubt by the masses and still remains to them what it has been christened by a more or less scoffing public press, "The Mosquito Theory." They must also remember that yellow fever and malaria will occur in sporadic cases, no matter how carefully the modern precautions are taken or improved sanitation is carried out. The situation in fact resembles that of the New England town after the installation of a fire engine, which was purchased by the "selectmen" against the wishes of a majority of the inhabitants. Soon after its appearance a fire broke out. This was in course of time followed by another conflagration, and then the wrath of the community was poured out in floods on the heads of the officials. They did not take into consideration that the fire was more easily subdued and the resulting damage less; they had spent the money and they were dissatisfied with the result attained. Now the amount of materials for use in disinfecting already purchased and forwarded is as follows: 14 tons of insect powder in 16 shipments; 52 tons of sulphur in 17 shipments; 2 tons of sulphate of iron; 23 tons of chloride of lime; 500 pounds of sulphate of copper.

Take this list of materials and add to it the expense of laborers, "which have been allowed as required and as necessary and have been numbered by hundreds in the Health Department" (see "Reply Isthmian Canal Commission," page 32) and let there be a few cases of yellow fever in the canal zone, and the American secular press will shout in glee from the very hilltops. Not only will they influence the people at large, and through them the Congressmen, in regard to appropriations, but they will cast discredit and unbelief over what has been the greatest triumph in American preventive medicine.

There is another point, too, that should be remembered, and that is, that the comparison so

often made between the work at Havana and that on the Isthmus is not a fair one. For the situation is a different one. In the first place, Havana was a paved city, no matter how dirty it may have been, while the track of the canal lies through an uncut, almost impenetrable jungle. Again the work in Cuba was accomplished under the rule of Gen. Wood, who was not only himself a medical man, but he was also a military governor, with personal and direct command of unlimited money, for which he did not have to account to the United States. He was a dictator, simply expending the revenues of Cuba, and had he so desired he could have drawn a check for a million of dollars and expended it for warming pans without being obliged to submit a voucher to the Treasury Department, for not one dollar of the funds of this government was spent in sanitation there.

Now, the one power similar to this is vested in Congress. If it had desired, Congress could have appropriated a lump sum to a medical commission who could by their orders have expended it without delay, friction or red tape. But Congress did not only *not* do this, but particularly avoided it, so as every cent spent in this work has to be expended by rules laid down in the previous bill, it strikes us that the time has come when the whole energy of the medical profession should be concentrated on an effort to induce the next Congress to pass such a bill and not be wasted in expostulations with a commission appointed to carry out certain definite instructions. If the present restrictions are cumbersome, as without doubt they have proved to be, then get Congress, who has the power to do so, to change them. Meanwhile bend every effort with the force and material at hand to make as good a showing as possible, and thus avoid a total loss of all that has been hitherto accomplished.

As we have already stated, we have at this time nothing to say in regard to the merits of this controversy, but we must admit that in one case cited the commissioners erred; if not in the abuse of power, at least in the exercise of tact. When the "expert" from Panama presented his letter from Dr. Gorgas to the chairman at Washington, requesting that he might be permitted to select the X-ray and microscopical apparatus, he was informed that he could proceed to New York invested with full power to make the purchase. At this he demurred and stated, "that the commission asked too much, that he had other things to do and did not care to work on his vacation, and that someone else should be asked to select them." Whereupon the matter was submitted to the Marine Hospital Service, with the request that they should purchase them. Now, we are not ourselves "surgeons in the service," but we have lived near the rose and recognize its perfume. Moreover, we can realize that nothing would be so galling to the Colonels and Majors of one branch as to be obliged to use the apparatus selected and purchased by the Admirals and Commanders of the other.

HOME AND DISPENSARY TREATMENT OF PULMONARY TUBERCULOSIS.

IN the March, 1905, *Post-Graduate* are interesting accounts of the results of home and dispensary treatment of the consumptive poor, as carried on at the Post-Graduate Hospital Dispensary from 1898 to 1905. The plan of treatment was inaugurated by Dr. John F. Russell, and has been carried on by him and by his assisttants, though the reports are from a committee of inspection appointed by the trustees of the institution.

Starting with the assumption that consumption is only possible with defective nutrition, and notably with defect in the storage of fats, the plan of treatment is essentially dietetic, with especial reference to the supply of fats. During examinations the patients remain at home in bed, but many have carried out the treatment to a successful end while pursuing their regular work. When under full diet the patient receives proteids, 181 gms., fats 316 gms., carbohydrates 239 gms., of 4,668 calories. This is 608 more calories than prescribed in Playfair's dietary for a man doing hard labor, and two to three times its amount of fats, and about half the carbohydrates most authorites regard as necessary for laboring men.

Under this method of treatment the committee of inspection reports forty apparent cures, the cure being based upon the disappearance of tubercle bacilli from the sputum, disappearance of symptoms, and gain in weight. Of fourteen patients whose histories are given in detail, who completed an eight weeks' course of treatment in bed, the average gain was 15.1 pounds, the least gain being 5.5 pounds, the greatest 24.5 pounds.

Beginning with the year 1905 the treatment is carried out at a small, specially equipped, hospi-

tal, at 322 East Nineteenth Street. In these new surroundings, where the dietetic needs of its individual patients can be more positively ascertained by means of chemical analysis of tissue waste, still more satisfactory results may be looked for.

SOME ASPECTS OF PUBLIC SANITATION.

THE heated controversy between the New York municipal authorities and the Interborough Rapid Transit Company, over the right of the former to compel the removal of signs and other impedimenta from the subway, is awaiting judicial decision.

Those who have followed the proceedings incident to this litigation may recall that each party has called to its aid the services of a prominent sanitarian. Dr. George A. Soper, on behalf of the city officials, submitted an affidavit affirming his belief that subway signs afford a nidus in which, under the favorable condition of absence of sunlight, a host of pathogenic bacteria may propagate at liberty. The parties interested in keeping these embellishments of the tunnel stations retained the services of Dr. Wm. H. Park, who found experimentally that dust removed from the frames of the subway signs actually showed fewer colonies of bacteria than equal quantities of dust removed from different parts of the street and sidewalks above.

At first sight, the results of these investigations would seem to seal the fate of the people's case. But on close analysis, the bacteriological findings lose in significance. Would it be too exacting to ask whether the subway porters had been given secret instructions the day before to thoroughly wipe the gilded frames enclosing eulogies of somebody's "Consumption Cure" or "Hair Restorer"? Moreover, it was too premature to take account of such emergencies as the subway strike, when the walls of the stations would naturally be neglected. Besides it is hardly fair to compare an enclosed space in which, as the strike has abundantly indicated, the public may be compelled to crowd and await indefinitely the arrival of the next express, with the broad open highway above, where no one is obliged to linger and where crowding is rare. It certainly does not redound to the credit of the street-cleaning authorities that so many bacterial cultures could be obtained from the public highway—but here we are giving the subway people a retort to fling back at the city officials. In short, the question narrows itself down to this: Shall any weight be given to bacteriological findings under the conditions cited above, at a time when the subway is new, and when far different results may be obtained at a later date, particularly when interested vigilance is apt to be relaxed?

The campaign against public expectoration is still being fought, and although a considerable degree of success is being achieved, a great deal remains to be done. The health officials are coming to realize that the almost total abolition of the spitting evil will not result from merely punitive efforts, but will be attained only by a general educational uplift of the masses. As the first step in this direction, little slips of paper will be pasted in all the text-books issued to the public-school children, on which are printed descriptions of the evils of expectoration. It is true that the children are not the main offenders in this direction, but the text-books come into thousands of households, and the pasters will certainly attract the attention of many offending adults. It has been suggested that more immediate good would be accomplished by having these hygienic instructions printed on cigar labels, tobacco-wrappers, street-car transfers, etc.

An evil whose consequences are far more baneful than those of expectoration, and which has been curiously overlooked by health authorities, is the practice frequently indulged in by passengers in public cars of coughing indiscriminately without protecting their mouth by means of a handkerchief, or even their hand. During a grippe epidemic it is not uncommon to see a dozen individuals in the same car indulging in coughing and sternutatory efforts to their heart's content. These two reflex acts, when the mouth or nostrils are unguarded, are far more dangerous than expectoration; in fact, the product of a cough may be termed a nebulous expectoration. Disseminated thus by a germ-laden atmosphere, no wonder many diseases involving bronchial irritation are so markedly contagious.

ECHOES AND NEWS.

NEW YORK.

The Meningitis Situation.—One hundred and thirty-one persons died of meningitis last week, as compared with eighty-five the week before, and the latter number of deaths was higher than that of any of the preceding six weeks, the figures running for the last eight weeks 27, 40, 48, 62, 78, 85 and 131. For the week of 1904 corresponding to last week the deaths from this disease numbered thirty-one.

Physicians in all parts of the city have been called to attend hundreds of cases of the disease in its milder form.

Board of Estimate Appropriation.—The Board of Estimate has authorized the issue of bonds to the amount of $1,000,000 for the use of the Board of Health in improving hospitals, and $750,000 to improve the sanitary condition of the celebrated Gowanus Canal, in Brooklyn. Dr. Darlington, president of the Board of Health, had asked for $4,500,000 for building new pavilions and additions to various hospitals and for general improvements. The board went through his list and selected what they regarded as urgent matters and gave him $1,000,000 for the year. This is in addition to the regular annual appropriation for current expenses.

Society of Sanitary and Moral Prophylaxis.—A meeting of this Society will be held at the Academy of Medicine, 17 West Forty-third Street, on Friday evening, April 14, at 8:30 P.M. The following is the interesting program: (1) Adoption of Constitution and By-Laws; (2) Education in Sexual Hygiene, by Dr. John H. Elliott, of the Hudson Guild; (3) The Sexual Necessity, by Dr. Edward L. Keyes; (4) Attitude of the Church toward Sexual Hygiene, by Rev. Henry A. Brann, Rector of St. Agnes' Church; (5) Ignorance, Perversion and Degeneracy, by Frank Moss, Esq., of the Society for the Prevention of Vice; (6) Education within the Medical Profession, by Dr. Prince A. Morrow. The papers will be discussed by prominent members of the laity and of the medical profession.

A Sanitary Census.—Although the taking of a sanitary census of the city has been contemplated for some time by Health Commissioner Darlington, the baffling persistence of cerebrospinal meningitis has emphasized its urgency, and the work is to be undertaken promptly. Cards have been made out, by means of which the number of persons in each house, their nationality, condition of health, date of birth and other essential information can be recorded. If a foreigner is suffering from any disease an attempt will be made to discover whether he contracted it before coming to this country or since. Also the number and character of cases of illness in any one house within a year will be set down, with the conditions prevailing in the house.

The New St. Francis Hospital.—While the medical board of the St. Francis Hospital has to express regret in the annual report that the new hospital is not yet ready for occupancy, as it was expected that it would be by this time, it shows that the work accomplished during the year in the present quarters has been more than ordinarily successful. The delay to the big new building now being erected on East One Hundred and Forty-second Street has been caused by labor troubles, but as the strikes have been declared off, it is almost certain that the sisters will move to their new home at least by September. During the year 2,797 patients were treated, of whom 1,684 were cured and 495 were reported as having distinctly improved. The death rate for the year was 9.84 per cent. On January 1, 1905, there were remaining in the hospital, 251 patients. The details of the medical report, in which figures are given concerning the treatment of every disease treated in the hospital, afford some idea of the diversity of the work of the physicians and surgeons. They cover no less than seventeen pages of the pamphlet.

Poliklinik's New Home.—The German Poliklinik of this city, which has recently purchased the building of the German Dispensary, at No. 137 Second Avenue, is making an appeal to its friends for subscriptions to its new building fund. The German Poliklinik is a charitable institution for the free medical treatment of the sick poor, founded in the year 1883. Since that time its corps of physicians have taken care of 327,282 patients, free of charge; these patients visited the Poliklinik 1,014,682 times, and received 723,355 prescriptions, which were compounded in the drug store attached to the institution. The present building, Nos. 78 and 80 Seventh Street, having become visibly inadequate for the work required, the society contemplated enlarging its facilities by making extensive alterations, when it learned of the possibility of acquiring the building of the German Dispensary, and after some negotiation with the board of trustees of the German Hospital and Dispensary, the contract was signed for the purchase of the property. It is said for the Poliklinik and without fear of contradiction that this charity, with the old German Dispensary gone, will become absolutely indispensable to the sick poor of the lower East Side. Henry Schmidt, M.D., No. 78 Seventh Street, is treasurer of the German Poliklinik.

Meningitis Commission Meets.—The commission to investigate cerebrospinal meningitis, appointed by Health Commissioner Darlington, had its first meeting recently, in the Health Department building, at Fifty-fifth Street and Sixth Avenue. The commission consists of Drs. W. F. Polk, W. B. James, W. P. Northrup, Simon Flexner, J. F. Van Cott, E. K. Dunham and William K. Draper. Dr. Polk, who is dean of the Cornell medical school, has not yet accepted the appointment. He was the only member absent at this meeting. His place as chairman of the commission was filled temporarily by Dr. James. Dr. Draper was appointed secretary. The commission spent some time studying maps of the city with regard to the prevalence of the disease in certain localities, and in considering the conditions peculiar to those localities. They also had before them the tabulated statistics of the disease for several years back. Drs. Northrup, James and Draper, representing the clinical end of the committee, and Drs. Flexner, Van Cott and Dunham, the bacteriological end, then considered in groups and points to be investigated under each head. The commission decided to issue cards to doctors in hospitals, with blanks to be filled in with desired data, as was done by the pneumonia commission last year. While the final list of questions to be asked in these cards was not settled, the commission will want to know, under the bacteriological end of the investigation, what are the evidences of communicability and what is known of the biology of the disease bacilli, with reference to differentiation, agglutination and pathogenesis. Under the clinical head they will inquire about the effect of drying on the bacilli and viability in spray, as bearing on isolation and infection. Complete information about the patients' surroundings and the conditions under which they were stricken with the disease will also be collected. It is probable that the scope of the investigation will be world-wide and that information will be sought from hospitals all over the globe. This commission is only the second of the kind that has ever been appointed in New York. The pneumonia commission, appointed last year, is still at work.

Manhattan Dermatological Society.—Regular monthly meeting of this society was held on Friday evening, March 3, 1905, at the residence of Dr. I. P. Oberndorfer, with Dr. E. L. Cocks, presiding.

Dr. W. S. Gottheil showed the following cases: (*a*) Case for diagnosis; a boy of eight years showed lesions on the face, about arms and abdomen; lesions of two years' duration; history shows a brother likewise affected; the lesions consist of old scars and the newer ones, of ulcerating, hypertrophic granulations of varying sizes and in all stages of evolution, from small beginning necrotic lesions to large ulcerating masses. Dr. Gottheil believes the condition to be hereditary syphilis. Most of the members agree in calling it hereditary syphilis. Dr. Cocks thinks a tuberculous process may likewise be present. Dr. Allen is of the same opinion. (*b*) Dr. Gottheil again presented his case of acne cornea; new lesions are seen on the face and also on the hands. Old lesions disappear spontaneously. (*c*) Dr. Gottheil then showed a made adult with a lesion on penis. The patient states he had a sore on penis a short time ago; at present there is some induration at this site; also dry scaly patches of eczema along the glans penis, extending from the urethral orifice; some macules observed on body and a few very large papules on lower limbs. Patient is not taking any drugs. Drs. Bleiman, Weiss and Heiman regard the initial lesion as chancre and the scaling patches on body as a psoriasis. Dr. Kinch said the early appearance of a scaly eruption on body coincident with the appearance of the chancre did not favor diagnosis of a luetic body lesion; the latter he regards distinct and as psoriasis. Dr. Pisko favored diagnosis of syphilis for the lesion on body. Dr. Oberndorfer said the lesion on body was a very early manifestation, if it were a syphilitic lesion. He had some doubts about it. The penile lesion was a hard chancre. (*d*) Dr. Gottheil also showed a boy with well-marked patches of leucoderma; scabies was also present.

Dr. A. Bleiman showed a case of prurigo in a boy of eight years (same case shown last spring), illustrating the result of treatment. A few papules and squamous lesions with slight induration of the skin over the shins are still observed, but in all the condition of the skin is considerably improved. The patient has never enjoyed freedom from eczematous lesions, for so long a period, now six months, since the process began when two years old, and the prognosis as to ultimate recovery seems to be good. The best results seemed to be obtained after the use of 2 per cent. ichthyol ointment, daily baths and internally syr. ferri iodati.

Dr. B. F. Ochs presented a woman, showing gummatous lesions on the lower leg extending to and involving the foot. A second case (in a woman) of a complete perforation of the cartilaginous septum of nose; ten years ago history of nasal catarrh with beginning flattening of the nose; one year ago similar symptoms. There is no history of infection and no other lesions present on any part of the body. Dr. Ochs presents it as a case of syphilitic necrosis.

Dr. Kaplan showed for Dr. Gottheil a case of nevus unis lateris; a boy of four years presents an intensely blue nevus, covered abundantly with fine hairs, along the right upper and lower arm; a few isolated warty pigmented spots on back and left arm. Dr. Gottheil stated the condition might be better termed nevus pilosis, as pigmentosus verrucosus (congenital) X-ray will cause epilation; as to ultimate results he is doubtful if any course of treatment would influence it. Dr. Bleiman said, as to prognosis, in advanced adult life such a growth may be a source of danger and assume malignancy. Dr. Allen advocated X-ray and high frequency spark. Dr. Pisko saw a similar case in which X-ray and high frequency currents showed no decided results; but electrolysis for destruction of the hairs partially succeeded. At present the case is under ultraviolet exposures and the condition still remains unchanged.

PHILADELPHIA.

A Benefit for the Hahnemann Hospital.—The proceeds of the tableaux given last week at the New Century Club will go to the Hahnemann Hospital.

Resigned.—F. W. Koons, superintendent of the Hahnemann Hospital, resigned his position, stating that he intends to resume his studies in medicine next fall.

Portrait of Prof. Forbes to be Presented to the Jefferson Medical College.—As a token of their respect, the undergraduates and alumni of the Jefferson Medical College, will present to the College the portrait of Dr. Forbes.

Leper Patient Improving.—Moses Kailioha, a Hawaiian leper, who has been at the municipal Hospital for one year, is improving rapidly under the treatment instituted. So encouraged are the physicians at the hospital that they cherish the possibiliy of curing the patient.

To Discriminate in Dispensary Practice.—The Senate has passed a bill which gives to the State Board of Charities the power to license and regulate dispensaries. The bill makes it a misdemeanor for any person to obtain medical or surgical treatment at the dispensaries on false representation as to their financial condition.

An Act to Modify the Proceedings of the State Board Examination.—Through the influence of Dr. J. W. Holland, Dean of the Jefferson Medical College, a bill has been introduced into the legislature which, if passed, will permit a medical student, at the end of his sophomore year, to take the State Board Examinations in anatomy, chemistry and physiology.

Conference of Anatomists.—Upon April 11 and 12 the American Anatomists will meet in the Wistar Institute of Anatomy at the University of Pennsylvania, this city. The most important subject which will be brought up for discussion, is the founding of a central institute for cooperative investigation in the realms of anatomy. On the evening of April 11 the conference will be tendered a reception by General Wistar at his home, southest corner of Seventeenth and Spruce streets.

Diplomas Awarded.—Last week eighteen young women, of the Pennsylvania Hospital Training School for Nurses, received their diplomas, which will entitle them to enter upon their chosen profession. The diplomas were presented by J. T. Shinn, secretary of the Board of Managers, and after the presentation Dr. Alfred Stengel, of the hospital stag, delivered an address during which he informed the young women that they have chosen a profession which requires more sincere work and patience than any other calling and that their success will depend upon the exercise of skill and ability to the best advantage and upon the application of the accumulated practical knowledge received at the hospital.

Sanitation in Office Buildings.—This was the subject of Dr. Henry Leffmann's paper read before the regular meeting of the Engineers' Club. He first spoke of the bad quality of water supplied and then of the additional contamination of the water by ice

which is infected by the buckets and containers in which it is distributed to the water tanks. He told his audience that the water which he drinks is cooled merely by contact, that is, he allows the bottle containing the water to lie in contact with the ice only. In speaking of cleaning a building, he maintained that the vacuum system of removing dust is the proper one, for it gets rid of the dust while the ordinary method merely stirs it up from day to day.

Academy of Surgery.—The meeting of this society was held April 3. Dr. G. G. Davis read a paper on the "Treatment of Fractures about the Neck of the Femur in which Fixation was Accomplished by Means of a Screw." The paper was discussed by Drs. Keen, LeConte and Roberts. Dr. A. C. Wood read two papers; the first on "Strangulation of the Vermiform Appendix by an Abnormal Opening in the Mesentery;" a second one on "Vermiform Appendix in the Sac of a Femoral Hernia." He reported two cases. This paper was discussed by Dr. Gibbon. Drs. Royer and Schwartz then read a paper on "A Case of Anthrax." Drs. Keen, Willard and Jopson discussed it. Dr. Keen then read a paper on "A Method to Fill Defects in Bone by Bone Chips." Dr. Stewart read a paper on "Osteomyelitis of the Tibia," in which the shaft was removed.

Governor Vetoes Bill to Check Idiocy.—The Governor takes the ground in vetoing the bill that the language is not clear, in that it does not describe the nature of the operation that is to be performed. He maintains that the safest and most effective method of preventing procreation would be to behead these individuals and such authority, he says, is given to the scientific men by the bill. A surgeon, he intimates, may be so eager to advance in skill as to forget the dangers he may subject his patients to. Such a bill, if passed, would violate the principles of ethics. These feeble-minded and imbecile children, he declares, are entrusted to the institutions by their parents or their guardians for the purpose of training and instruction. It is proposed to experiment upon them not for their instruction but for the welfare of the society and without the consent of the parents or the guardians. The Governor believes that if idiocy could be prevented by an act of Assembly such an act would have been passed long ago.

The Pennsylvania Legislature has Passed the Following Appropriation Bills.—*Philadelphia*, Woman's Medical College Hospital, $100,000; St. Agnes' Hospital, $100,000; Sanitarium Association, $10,000; Hospital Department, Hahnemann Medical College, $416,000; Philadelphia Orthopedic Hospital, $35,000; German Hospital, $110,000; St. Luke's Homeopathic Hospital, $150,000; Philadelphia Home for Incurables, $50,000; St. Mary's Hospital, $37,000; Wills Eye Hospital, $80,000; Philadelphia Lying-in Charity, $20,000; Rush Hospital for Consumptives, $210,000; Pennsylvania Sanitarium and Benevolent Association, $20,000. *Other Appropriations for Pennsylvania*, Bedford County Hospital, $21,000; Todd Sanitarium, Cambridge Springs, $6,000; Easton Home for Friendless Children, $3,000; Home for Aged and Infirm Women, Easton, $3,000; Good Samaritan Hospital, Lebanon, $31,500; York Hospital and Dispensary, $30,000; Williamsport Hospital, $50,000; Florence Crittenton Mission, Williamsport, $15,000; Home for Friendless, Williamsport, $15,000; Aged Colored Women's Home, Williamsport, $1,000; Chester Hospital, $30,000; Pottsville Hospital, $60,000; Meadville City Hospital, $14,000; Coatesville Hospital, $15,000; Todd Hospital, Carlisle, $7,000; Shenango Valley Hospital, New Castle, $41,000; State Hospital for Insane, Warren, $196,500; Western Pennsylvania Colored Industrial School, Lawrence County, $5,000; Valley Forge Park Commission, $116,815; Medical and Surgical Department of the Western Hospital of Pittsburg, $180,000; Allegheny County Association for the Prevention of Cruelty to Children, $7,000; St. Joseph's Hospital and Dispensary, Pittsburg, $75,000; Bradford City Hospital, $87,000; Phoenixville Hospital, $60,000; Mercy Hospital, Wilkesbarre, $45,000; Lock Haven Hospital, $25,000; Nason Hospital, Roaring Springs, $15,000; Women's Homeopathic Association of Pennsylvania, $85,000; Eagle Hospital for Consumptives at Summit Hill, Carbon County, $8,000; Charity Hospital, Pittsburg, $100,000; Children's Industrial Home, Harrisburg, $9,000; Conemaugh Valley Memorial Hospital, Johnstown, $45,000; Beaver County General Hospital, at Rochester, $12,000; Benevolent Association's Home for Children, Pottsville, $2,000; Children's Aid Society of Pennsylvania, $30,000; Du Bois Hospital, $6,000; Spencer Hospital, Meadville, $20,000; Mary M. Packer Hospital, Sunbury, $10,000; Chester County Hospital, West Chester, $20,000; Pittsburg Hospital for Children, $68,000; House bill to provide for a deficiency in the care of indigent insane, $100,000; House bill for the care and treatment of the indigent insane for the next two years, $2,000,000; Easton Hospital, $70,000; State Hospital for Insane, at Norristown, $223,000; to cover deficiency in the Pennsylvania Training-school for Feeble-minded Children, at Elwyn, $36,874; State Hospital, Phillipsburg, $22,195; Pennsylvania Reform School, Morganza, $117,588; for the erection of a State Hospital for the Criminal Insane, $160,000; establishing an emergency fund for the suppression of epidemics, $75,000; State Hospital for Insane, Danville, $251,450; Titusville City Hospital, $14,000; Miners' Hospital, at Spangler, Cambria County, $15,000; Beaver Valley General Hospital, Beaver County, $37,000; Adrian Hospital, of Jefferson County, $24,000; Clearfield Hospital, $21,000; North Pennsylvania General Hospital, at Austin, $10,000; Monongahela Memorial Hospital, $20,000; Home for the Friendless, Harrisburg, $5,000; Wilkesbarre City Hospital, $70,000; Altoona Hospital, $50,000; St. John's General Hospital, Allegheny, $45,000; Sylvan Heights Home for Orphan Girls, Harrisburg, $10,000; Messiah Home Orphanage, of Harrisburg, $3,000; Johnstown City Hospital, $5,000; McKeesport Hospital, $80,000; St. Joseph's Hospital, Reading, $30,000; Homeopathic Medical and Surgical Hospital, Reading, $38,000; Reading Hospital, $39,000; Lewistown Hospital, $15,000; Allentown Hospital, $30,000; St. Luke's Hospital, South Bethlehem, $56,000; Home for Friendless Children, Reading, $7,000; Children's Home, South Bethlehem, $1,000; for two State institutions for the treatment of incipient tuberculosis, $300,000.

CHICAGO.

Epidemic Cerebrospinal Meningitis.—Between the first of the year and the present date, March 25, this disease has caused 550 deaths in New York City, a greater number than from any other cause except pulmonary consumption and the pneumonias, and the health authorities have secured a special appropriation with which to combat the pestilence. Of the four deaths reported in Chicago from this cause during the week, the latest, on Saturday, March 25, Dr. Wm. J. Class has completed his investigations of the first three, and reported that the evidence was not conclusive as to the nature of the disease. All three died of meningitis, but supervening on other diseases—two of them afflicted with

measles, and simple meningitis is a not uncommon complication in such cases. Proof is lacking that this was of the epidemic type. Thus much space is given to this subject now, because cerebrospinal fever is epidemic elsewhere, and may become so in Chicago; and because the disease is contagious and all suspicious cases should be isolated and treated as other contagions, including prompt report to the Health Department.

Sensational Medicine.—The Chicago Health Board Report remarks Dicken's fat boy "Joe" is again loose in the columns of the newspaper press and he "wants to make your flesh creep" with tales of half a million babies poisoned every year, with formalin in their milk; of unnumbered others of all ages, more slowly but not less surely done to death by borax and similar preservations in their adulterated food and drink of every description; and of hecatombs of victims of rare and therefore terrible diseases. Where all these slain are buried, how their corpses evade the undertaker and the certifying physician, the burial-permit clerk, gravedigger and cemetery superintendent is a mystery—the only solution of which is that "Joe" lies. Here in Chicago, where the death rate of all ages has diminished from 19.9 per 1,000 in 1890 to 13.6 per 1,000 in 1904, the deaths among the formalin-milk fed young have fallen from 707 in every 10,000 during 1890, to 347 in every 10,000 during 1904. These assertions do not rest solely on the testimony of the Department's Bureau of Vital Statistics, but are corroborated by the experts of the Federal Census Office.

An Act to Regulate the Practice of Optometry.—After due consideration of a Bill which is now pending before the State Senate, the Chicago Medical Society is of the opinion that the adoption of this Bill would be unwise and not in the interests of the people, and therefore appeals to Senators to vote against it. The Society gives the following reasons: (1) If a person's eyesight is defective, the first question to settle is whether the defect is due to disease or not. As the optometrists have not the requisite medical training to know whether an eye is sound or diseased, they are not competent to take care of and to prescribe for defects of the eyesight. (2) The fitting of glasses, especially for children and young adults, cannot be done accurately and satisfactorily without the use of the proper drugs. Innumerable instances could be cited, if desired, in which children received wrong glasses, to the detriment of their eyes and health, because no drugs were used in the examination of the eyes. This Bill, therefore, not only fails to improve upon the existing practice of opticians in prescribing glasses over the counter, but it puts the stamp of approval upon an unscientific and unreliable practice, and the Society believes it should be defeated.

Antitoxin Treatment of Diphtheria.—Ten years ago the antitoxin treatment of diphtheria was begun by the Department of Health of Chicago. During the previous ten years ended December 31, 1894, there had been 13,566 deaths from diphtheria and croup reported to the Bureau of Vital Statistics, a yearly average of 1,356, and a proportion of 13.53 deaths in every ten thousand of the population. During the ten years ended December 31, 1904, there were only 8,129 such deaths reported, a yearly average of 812, and a proportion of less than 5 (4.88) in every ten thousand of the population. These figures show a reduction of 5,437 in the actual number of diphtheria and croup deaths since the Department began the antitoxin treatment. They show a relative reduction in proportion to increased population of nearly 64 per cent.—63.9. Which is to say that, if the ravages of diphtheria had not been checked by the use of antitoxin during the last decennium, there would have been 22,538 deaths from this former scourge of the nursery, instead of the 8,129 that did actually occur—a saving of 14,409 lives. The satisfaction of the Department with its diphtheria antitoxin record is heightened by the reflection that the present administration of the Department inaugurated the work upon which the records are based.

GENERAL.

A Royal Physician.—On February 23, His Royal Highness Duke Karl Theodor of Bavaria, celebrated the twenty-fifth anniversary of his graduation as a Doctor of Medicine.

Dinner to Dr. Osler.—A farewell dinner to Dr. William Osler will be given at the Waldorf-Astoria, New York, on Tuesday evening, May 2, and invitations to subscribe can be obtained by applying to the Chairman, Dr. James Tyson, 1506 Spruce Street, Philadelphia, until April 20.

Gaillard's Southern Medicine.—Since the Amalgamation of *Southern Medicine and Gaillard's Medical Journal* (in October, 1904,) it has been decided to consolidate the name to *Gaillard's Southern Medicine* published by Gaillard's Southern Medicine, Inc. The officers of the incorporation are William Edwards Fitch, M.D., President and Treasurer; M. C. Fitch, Vice-President, and E. W. Fitch, Secretary.

Appointments of Drs. Barker and Thayer.—The Trustees of Johns Hopkins University elected Dr. Lewellyn Franklin Barker, now head of the Department of Anatomy in the University of Chicago and Rush Medical College, April 3, to the Professorship of Medicine made vacant by the resignation of Dr. William Osler. At the same time Dr. William Sydney Thayer, Associate Professor of Medicine in Johns Hopkins, was elected Professor of Clinical Medicine, a new chair.

A Medical Author.—Major Louis L. Seaman, who served as a surgeon in the United States Volunteers in the Spanish-American and Philippine wars and with the allied armies in the Boxer campaign in China, and whose account of the health conditions in the Japanese army has been more than once referred to in the various medical journals, has embodied his experience in a book entitled "From Tokio Through Manchuria with the Japanese," just published by D. Appleton & Co., New York. The work contains forty-two full-page photographic illustrations.

International Congress.—The Fifteenth International Medical Congress will he held at Lisbon in April, 1906. At a meeting of the National American Committee, held at St. Louis last September, the following Executive Committee was appointed: Frank Billings, M.D., William Osler, M.D., Frederick Shattuck, M.D., Abram Jacobi, M.D., and J. H. Musser, M.D., chairman. Any communications regarding the presentation of papers at this Congress can be sent to Miguel Bombarda, secretary at Lisbon; or to Dr. Ramon Guiteras, New York, secretary for this country.

An Antivivisection Story.—A prize was lately offered for an antivivisection story. If, says the *British Medical Journal*, we may judge from the accounts of it which we have seen, "Trixy," by Elizabeth Stuart Phelps Ward, an American writer of some note, would seeem to be the kind of thing required. Here is the lady's description of the assistant director of a large surgical institute in which researches in physiology are carried out: "His face . . . was brutal. He had the eyes of an inquisitor, lowering and shifty. To an ordi-

nary citizen his was a face to be dreaded. It was the type that was common in the sixteenth century. It was broad, flat, and surmounted by a rebellious fiery mane. But if his face would inspire dread, his hands gave the layman a nameless apprehension." A charming portrait; one wonders if it is from life. If it is, it is not unlikely that one of the antivivisectionist fraternity unconsciously sat for it, for faces of the inquisition type are, as far as our observation goes, more common among them than among their opponents.

Plague in India.—The terrific and increasing mortality caused by the plague in India is the subject of grave anxiety, as well as of much present hopefulness, on the part of the British authorities. At latest reports, deaths amounted to more than 35,000 a week. Nothing seems to avail against the disease except inoculation, to which the natives will not submit. At every return of cold weather the disease breaks out with renewed virulence. In the last week of December, 1902, the deaths were 14,000; in the same week of 1903 they were 17,000; in the last week of December, 1904, the total reached 19,645. Since then the mortality has increased at a terrible rate. For some years the plague made little progress in the United Provinces of Agra and Oudh, but during the last few months it has spread rapidly in this part of India, while in the Punjab the mortality threatens to be greater than ever. During the week ending January 28 the total number of deaths from plague reported throughout India was 33,087; for the week ending February 4 the total was 36,167; for the week ending February 11, 33,660; for that ending February 17, 27,837, and since then the mortality has risen again. Rather late in the day a special commission has been appointed to study the ethnology of the disease.

Cancer in Young Subjects.—Ten recent cases of carcinoma in subjects under thirty-one have been collected by Rhode (Inaug. Dissert., Greifswald, 1904). These cases are (1) cancer of the rectum in a tanner's boy, aged ten years; (2) cancer of the ovary in a maid-servant, aged nineteen years; (3) cancer of the stomach in a girl, aged twenty-two years; (4) cancer of the pancreas in a workman, aged twenty-three years; (5) cancer of the cardiac end of the stomach in a shepherd's boy, aged twenty-four years; (6) cancer of the duodenum in a tavern-inspector, aged twenty-five years; (7) cancer of the pylorus in a maid-servant, aged twenty-six years; (8) malignant gastric ulcer in a girl, aged twenty-six years; (9) cancer of the stomach in a maid-servant, aged twenty-nine years; (10) colloid cancer of the rectum in a baker (female), aged thirty years. These 10 cases were taken from a series of 322, cancerous patients on whom necropsies were performed in the Greifswald clinic in the course of twelve years. The number of cases from thirty to fifty years of age was 121; from fifty to seventy, 156, and from seventy to ninety, 35. Thus, although the number of cases in aged subjects was three and a half times as many as the number in persons under thirty years, the latter are not so free from malignant disease as is generally supposed.—*British Medical Journal.*

Medical Society of the Missouri Valley.—The seventeenth semi-annual meeting of this society met March 23, 24, 1905. The following program was given: "Surgical vs. X-ray Treatment in cases of Rodent Ulcer and Epitheliomata of the Face, with Demonstration of Operated Cases," by Dr. C. O. Thienhaus, of Milwaukee, Wis.; "Transverse Ribbon-shaped Cornea Opacity," by Dr. J. M. Sherer, of Kansas City, Mo.; "Some Points on Suprapubic Cystotomy," by Dr. E. N. Wright, of Olney, I. T.; "Injuries to the Spinal Column," by Dr. C. E. Black, of Jacksonville, Ill.; "Synchronous Extra and Intrauterine Pregnancy, with report of a case," by Dr. D. C. Brockman, of Ottumwa, Ia.; "Consideration of the Present Methods of Treatment of Retro-Displacements of the Uterus," by Dr. C. H. Wallace, of St. Joseph, Mo.; "Retrodisplacements of the Uterus; A New Method of Suspension," by Dr. O. B. Campbell, of St. Joseph, Mo.; "Surgical Treatment of Strangulated Hernia, with Remarks on Technic of Primary Bowel Resection," by Dr. John Young Brown, of St. Louis, Mo.; "Pelvic Inflammation, or Peri- and Parametritis," by Dr. H. C. Crowell, of Kansas City, Mo. Symposium on "Puerperal Fever." (*a*) "Diagnosis," by Dr. Robert T. Sloan, of Kansas City, Mo.; (*b*) "Treatment," by Dr. R. C. Moore, of Omaha, Neb.; "Chorio-Epithelioma Malignum," by Dr. A. P. Condon, of Omaha, Neb.; "Renal Affections Simulating Abdominal and Pelvic Diseases," by Dr. J. Block, of Kansas City, Mo.; "The New-born Infant; Its Care and Management," by Dr. A. D. Wilkinson, of Lincoln, Neb.; "Anesthetics," by Dr. Dora Greene-Wilson, of Kansas City, Mo.; "Some Observations upon the Treatment of Inguinal Hernia," by Dr. Prince E. Sawyer, of Sioux City, Ia.; "Functional Diagnosis of Kidney Diseases," by Dr. A. C. Stokes, of Omaha, Neb.; "Hypertrophy of the Thyroid Gland," by Dr. T. E. Potter, of St. Joseph, Mo.; "Rest in the Treatment of Select Cases of Mental Disease," by Dr. F. P. Norbury, of Jacksonville, Ill.; "Uterine Displacements," by Dr. W. O. Henry, of Omaha; "Abscess of the Rectum," by Dr. E. H. Trailkill, of Kansas City, Mo.; "Latter-day Aspects of the Pathogenesis of Cancer," by Dr. J. W. Ryan, of Coffeyville, Kans.; "Incipient Forms of Insanity and their Treatment," by Dr. John Punton, of Kansas City, Mo.; "Drainage in Acute, Diffuse Septic Peritonitis," by Dr. Van Buren Knott, of Sioux City, Ia.; "The Business Side of It," by Dr. J. R. Phelan, of Oklahoma City, Okla.; "Surgical Treatment of Postoperative Hernia," by Dr. Willett Bartlett, of St. Louis, Mo.; "Case of Choroiditis, probably due to Necrosing Ethmoiditis," by Dr. W. W. Bulette, of Pueblo, Colo.; "Diagnosis of Progressive Spastic Ataxia in its Early Stages; with report of two cases," by Dr. J. M. Dunsmore, of St. Joseph, Mo.; "Suspicious Symptoms of the Upper Abdomen; their Significance," by Dr. Jno. E. Summers, Jr., of Omaha; "Tobacco Amblyopia," by Dr. W. L. Kenney, of St. Joseph, Mo.

OBITUARY.

Dr. GEORGE F. LEICK, one of the best-known physicians of Cleveland, Ohio, and for several years head of the Department of Health, died March 31, aged forty-nine years.

Dr. CHARLES A. OLCOTT, ex-surgeon of the Fire Department, died last week in his fiftieth year at his home in Brooklyn. He was surgeon-major of the Thirteenth Regiment, and when that organization went to Montreal during Queen Victoria's jubilee he was made a member of the Queen's Own Guard.

Dr. WILLIAM BODENHAMER, the oldest resident of New Rochelle and once the family physician of Commodore Vanderbilt, died March 3 in his ninety-seventh year. He worked almost to the end in writing a contribution for a medical publication on disease of the lower bowels. He diagnosed the last illness of Commodore Vanderbilt, and he was one of the witnesses in the

will contest which followed the Commodore's death. He was also the physician of Gov. Curtin of Pennsylvania and of Commodore Garrison and other prominent men. For fifty years he had been almost a constant contributor to medical journals in America and Europe. Dr. Bodenhamer said that he owed his long life to temperate living. He was moderate in the use of liquor and tobacco, but indulged in both when he felt like it. Since he was twenty-two years old he never ate breakfast without having a little whisky toddy mixed for him.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, March 25.

THE GARCIA CENTENARY—THE PREVENTION OF CONSUMPTION—INFLUENZA AS A FASHIONABLE CAUSE OF DEATH—PHYSICAL DETERIORATION OF THE BRITISH RACE—HOSPITALS AND MEDICAL SCHOOLS.

THE great event of the past week was the celebration in honor of the hundredth birthday of the true begetter of the laryngoscope, the Spanish singing master, Manuel Garcia. Medicine and music vied with each other to do honor to the man who had annexed a new province to the healing art and who had trained Jenny Lind, Christine Nilssen, Charles Santley and many other famous singers. The reception room of the great house of the Royal Medical and Chirurgical Society in Hanover Square was packed with representatives of learned bodies, laryngological societies and musical academies, who all presented addresses. The introducer of the deputation was Sir Felix Semon, himself a copious orator whose speech, although he has lived more than thirty years in London, has still a strong Teutonic twang. Of the foreign visitors most attempted to give vent to their feelings in what seemed to be meant for English. The centenarian bore it all with a staying power that would have been wonderful in a much younger man. He brightened up visibly when he was addressed in Spanish by fellow countrymen representing the King of Spain, the Spanish Academy of Medicine, and the Laryngo-Rhino-Otoiatric Society of Madrid. The Royal Society before which Garcia read the account of his invention and the observations he had made by means of it presented a short address which may have been intended as a kind of reparation for the utter indifference with which it treated both the communication and its author. The Society has bestowed its Fellowship, which is the most coveted scientific distinction in this country, on many who have done nothing nearly so worthy of recognition. The King conferred on Garcia a commandership in his Victoria Order, a decoration that enables the proud possessor to put the letters "C. V. O." after his name. The opinion was pretty generally expressed that it would have been a graceful act if the "fountain of honor" had squirted just a trifle higher and made the old man a Knight. Manuel Garcia would do more credit to the order of knighthood than it could possibly bestow on him. In the evening there was a banquet at the Hotel Cecil, attended by nearly five hundred people, among whom were all the leaders in music and many of the bigwigs of medicine. There was an inordinate amount of speechifying, and I realized the force of Sydney Smith's suggested ecclesiastical punishment of being "preached to death by wild curates." The wonderful old man sat it out, however, and did not leave till late. He attended a Homeric banquet at the German Club an evening or two afterward, where he smoked cigarettes and drank a large glass of lager beer at midnight. I am told on good authority that he is not a bit the worse for the dissipation with all its attendant excitement and fatigue. He certainly is a marvel of vitality. Although somewhat bent he moves about without difficulty; he can make himself heard in a large room, and his handwriting is firm and beautifully distinct. He is alert and vigorous in mind, very ready in apt repartee and a graceful speaker. His great discovery was made when he was fifty, and he continued to teach till he was ninety. There is no apparent reason why he should not live for many years yet, to be a standing refutation of Professor Osler's doctrine.

The National Association for the Prevention of Consumption and other Forms of Tuberculosis held its sixth annual meeting on March 23. From the Council's report it appeared that the financial position of the Association was unsatisfactory, its expenditure during 1904 having exceeded its income. A special meeting is to be held in May under the presidency of the Lord Mayor of London with the object of bringing the merits and the needs of the Association before the moneyed men of the city. It was stated that a further step toward the suppression of spitting in public places had been taken by the London County Council, in regard to the common lodging houses under its control. It was mentioned that tuberculosis in children, especially the surgical forms of the disease had engaged the attention of the Association during the past year, and a subcommittee had made recommendations urging the necessity of providing special hospitals for such cases in the country or at the seaside on the lines of open-air sanatoriums for pulmonary consumption. It was pointed out that if special hospitals were provided children could be admitted at any age, and thus it would be possible to begin treatment at an earlier stage than was now feasible, and the patients could be kept until they were cured or proved to be incurable. It was suggested that for incurable cases separate homes should be provided. The report went on to say that this country lagged far behind some other countries in its provision for such children. It was hoped that the London County Council would see their way to devoting to this purpose the mansions often standing in the parks they acquire, and inquiry was made, but for the present the matter remained in abeyance. A gratifying step in the extension of public control with regard to tuberculosis had been taken by the Sandgate Urban District Council, who were seeking power, *inter alia*, to exercise control over hospitals or sanatoria for tuberculosis to introduce notification of the disease and to regulate the milk supply. The council said that the time was evidently close at hand when provision of sanatoria, municipal and other, would be on the increase. The principles and possibilities of sanatorium treatment were as yet but ill understood in this country. Open-air treatment was only efficacious, or at any rate only powerful to cure, when undertaken in an early stage of the complaint, and there was a fear that the system itself might fall into discredit if not wisely applied. It would be the duty of the association to educate and guide public opinion and supply information, to urge that cases be carefully selected and classified and kept under prolonged treatment, and that some means be found to provide for their after-care. Some system, too, must be devised to spread information as to the initial symptoms of phthisis and the importance of really early treatment. The Chairman, Lord Derby, in moving the adoption of the report, said that during the year new sanatoriums had been opened at Newcastle, Keswick, Glasgow, Gloucester, and in West Wales. Sheffield and Sandgate were the only towns

at present which had taken steps to enforce notification of the disease. The more local authorities insisted on this measure the more the movement would gather force. He expressed the opinion that in addition to the hospital or sanatoria, there should be places of rest—he did not like to call them homes for the dying—for cases in advanced stages of the disease, or altogether beyond recovery. The motion was seconded by Dr. Nathan Raw, of Liverpool, who has taken a prominent part in urging on municipal authorities the duty of providing sanatorium accommodation for the poor consumptives within the area of their jurisdiction. He referred to the fact that the principles and possibilities of sanatorium treatment were even now ill understood. Many doctors, he said, are not convinced of the value of the treatment; it is not surprising, therefore, if the general public is sceptical. Another and stronger reason for unbelief is that during the last few years unsuitable cases have been rushed into sanatoriums, with the inevitable result of failure, disappointment and wholesome condemnation of the system. The sanatorium, he urged, can be expected to confer benefits only on those patients in the early stages of the disease, who are also other suitable cases for treatment. The sanatorium alone will not stamp out consumption. County Councils and health authorities are holding their hands and the inevitable reaction has set in against sanatoriums. Dr. Raw feels sure that this will soon pass away. In the meantime he holds it to be the duty of every health authority to provide first of all a sanatorium for the treatment of early and suitable cases as a means of cure, and and also some means for the isolation of advanced cases. He concluded by saying that with a few exceptions, the respectable poor when attacked by consumption have no refuge but the workhouse. This is not creditable to England and does not compare favorably with what is being done in other parts of the civilized world. After the adoption of the report Sir William Broadbent moved a resolution to the effect that in the interest of the public health it is necessary that consumption and tuberculous disease generally in London should be dealt with in a comprehensive manner; and that this will be done most efficiently by the Metropolitan Asylums Board constituting itself the sanatorium authority for consumption in London. He said that there was in London an enormous amount of consumption and tuberculous disease. Some patients were actually paupers, and some just above that class. Many paupers suffering from tuberculous disease were in the workhouse, but most of them were in their own houses, and were a constant source of danger. Through the existence of advanced cases of consumption in the lower classes the well-to-do became afflicted; but with knowledge and better instruction in hygiene the well-to-do had no business with consumption. The consumption in the metropolis should be dealt with in a comprehensive manner; the only existing authority who could do this was the Metropolitan Asylums Board. If that body undertook to deal with consumption they would make a definite impression upon the amount of disease which existed, and they would not only save life, but promote the public health. The resolution was passed unanimously.

At a meeting of the Hunterian Society of London on March 22, Professor Clifford Allbutt, of Cambridge, introduced a debate on influenza, which in a mild form is somewhat prevalent at present. The Professor put forward some new points. For instance, he said that "influenza travels by express trains," and he cited facts to show that in the spread of epidemics towns at which through trains stopped were attacked first, while the smaller places served only by slow trains escaped for a time. Just as the Ganges was the home of cholera, so Northern China was the home of influenza, and the opening of the Trans-Siberian Railway had much facilitated the spread of the disease. "In the great epidemic of 1889 Bokhara was the point of dissemination into Europe, whence it followed three trade routes. It reached New York from England in just the time taken by the fastest steamer running at the time." Professor Allbutt stated his belief that only those cases were infectious in which the respiratory organs were implicated. He thought that occasionally the infection could be carried about by clothes for a few days. Children were not liable to the disease, and if they did catch it they soon recovered. The onset was always sudden—sometimes absolutely so. Thus a gentleman riding past the Professor's own house was stricken so suddenly with influenza that he fell off his horse. He mentioned that Sir William Broadbent had told him of a patient who drove in at one gate of a public park perfectly well and was prostrated by influenza before he reached the opposite gate. The Professor called attention to a new type of the disease, which he called continued influenza. During convalescence all special sensations were affected. Thus he himself was very fond of music, but after an attack of influenza he went to a concert and could not imagine how anybody could enjoy such a noise. At the end of an hour of boredom, he came out. Yet with complete recovery his enjoyment of music came back suddenly, curiously enough together with a renewed appetite for food. He believed that the misery and depression which so often followed influenza could be cut short by a plain diet of milk and vegetables. "Affectionate wives," he said, "dose their husbands with beef tea and other things supposed to strengthen, but these only delay recovery." Professor Allbutt holds that one attack of influenza confers immunity for a period of about six months against another. He also thought the tendency to suicide as a sequel to an attack of influenza was not so frequent nowadays as in the serious epidemics of the last decade. In the discussion that followed Dr. Franklin Parsons, of the Local Government Board, said that a public speaker with influenza could spread microbes into his audience for a distance of forty feet. He showed by curves that the type of the disease had changed, and instead of disappearing for long intervals was now constantly in our midst; in fact, has become endemic. A week rarely passed without several deaths from influenza being registered in London alone out of all the great centers of population included by the Registrar-General in his weekly mortality returns. It was a singular fact that although the doctors recognized influenza as an actual cause of death, they were loth at first to enter it on death certificates, probably because, in the public mind, it was regarded as so trivial a disease "that it was considered discreditable to die from it." Now, on the other hand, it was considered somewhat fashionable to die of influenza. Dr. Parsons went on to say that we were ignorant of the meteorological conditions governing the epidemics of influenza, but he thought it was pretty clear that we could not blame the weather, for epidemics had occurred in all seasons, though they were rare in the months of September, October and November. It was certainly not a "filth disease" such as enteric fever and typhus, and it was curiously infrequent where and when such diseases were prevalent.

Some figures recently published in the annual report of Major General H. G. Miles, Director of Recruiting, throw an unpleasant light on the unsatisfactory physique of the British working-classes from which our army is recruited. Of the men who presented themselves for

enlistment last year, 23,658, or more than 34 per cent., were rejected after medical inspection as physically unfit. In addition to those rejected by the medical officers, over 20,000 were refused by recruiting officers in the nine months ending September 30, 1904. In many districts the rejections on account of defective teeth were very heavy. In commenting on the figures the Director of Recruiting says: "The question of medical rejections is of great importance, and requires serious consideration in view of the large number of recruits that must annually be obtained. It may be that when the new pay conditions are thoroughly understood, recruits of a higher social class and physical development may be attracted, but it is unsatisfactory that such a large number of lads should fail, for various reasons, to attain to the standard required for entrance into the army, a standard which cannot be considered exacting." To say that the standard is not exacting is to put the case very mildly. And low as the standard is, the authorities encourage the medical officers not to be too strict in their requirements. I have heard of a too conscientious examiner of recruits being reprimanded for excess of zeal, and on one occasion not many years old, a hint, which like a royal invitation was in the nature of a command, was given to all the medical officers engaged in the work, not to draw the tape too tight in measuring the chest.

The report of the Royal Committee appointed to consider the relations of hospitals and medical schools, an account of which was given in a recent letter, has already had two results, unexpected and doubtless undesired by the antivivisectionists whose agitation led to the inquiry. The treasurer of the London Hospital has just announced that since the issue of the committee's report (which strongly condemned payments to medical schools out of moneys subscribed for the hospitals) a "discretionary fund" has been opened, which is to be used, according to the discretion of the governors, either for the purposes of the hospital or for those of the school. Within a week the subscriptions to this fund have flowed in to an amount twice as great as the sum ever before applied to teaching purposes. To-day it is announced that Mr. Alfred Beit, the South African millionaire, has been moved by a perusal of the report of the committee to increase the amount of his donation to the London University Institute of Medical Sciences from $25,000 to $125,000. He expressly states that he wishes by this gift to commemorate the great kindness of his friend Dr. Jameson, now Premier of Cape Colony, and the services of several members of the Faculty of Medicine during a recent illness.

SOCIETY PROCEEDINGS.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, held February 7, 1905.

The President, Joseph Fraenkel, M.D., in the Chair.

Two Cases of Dysbasia Angiosclerotica (Intermittent Claudication), with Demonstration of Calcareous Deposits in the Pedal Arteries.—Dr. J. Ramsay Hunt read this paper, and the demonstration of radiographs was by Dr. Arthur Holding. The first patient was a man, forty-nine years old. His occupation for the past thirty-two years had been that of an iceman, which necessitated long and frequent exposure of the feet to cold and wet. The patient had used alcohol and tobacco to excess for many years. He acquired syphilis in 1879. The following year he had some ulcerations on the right leg, and five years later suffered from ulceration of the palate, with perforation. In September, 1903, he had an attack of delirium tremens, for which he was treated in the alcoholic pavilion of Bellevue Hospital. Restraint was necessary, and he was bound in the usual manner by sheets attached to the wrists and ankles. The first symptoms of the present affection appeared immediately after his discharge from the hospital, and was attributed by the patient to the restraint used. He complained of stiffness in the toes and the left leg; also the ankle, and paraesthesia of the toes and edges of the feet. After walking a quarter of a mile, the prickling pain and stiffness became so distressing that he had to sit down until it wore off, which was the case after a few minutes rest. His symptoms were much worse in winter than in summer, and were especially severe on a cold day. On rising in the morning the feet and legs felt perfectly well and natural. Toward the end of the day the feet became puffed up and swollen, and presented a mottled and cyanotic hue. He complained that they felt cold most of the time. The posterior tibial artery was not palpable on either side. The dorsalis pedis was full and larger than normal. The femorals and popliteals pulsated normally on the two sides. The feet were cold, and on standing became red and swollen, with a distinct purplish tinge. Numerous venules and minute venous varicosities were present about both ankles, and along the anterior tibial region. The toe-nails on the left foot presented transverse ridges. The reflexes and sensations of the lower extremities were normal. Signs of a general arteriosclerosis were present, and the urine contained a faint trace of albumin, but no casts nor sugar. Its specific gravity was 1.017. Subsequent examination revealed an occasional faint pulsation in both posterior tibials, weaker on the left side.

The second patient presented by Dr. Hunt was a man sixty years old, who for fifteen years had been a longshoreman. For the past ten years he had worked in barrooms, where his feet had been exposed a good deal to the cold and wet. He denied lues. For the past fifteen years he had smoked from ten to fifteen cigars daily, and had used alcohol to excess. About five years ago he began to suffer from numbness, stiffness and cold sensation in the toes of the right foot, coming on about two hours after beginning work in the morning. At the end of the first year he was compelled to rest after about three hours. At the end of two years, his condition had grown worse; the paresthesia and stiffness had extended as high as the ankle, and rest was necessary after two hours work. After resting, and in the morning on arising, all his symptoms had disappeared. The symptoms in the left foot gradually grew worse, and six months ago similar symptoms appeared in the right foot, beginning in the toes. Both feet assumed a mottled appearance on standing, but did not swell. A pulsation of the femorals, popliteals and posterior tibials could be felt on both sides, while the pulsation of the dorsalis pedis was entirely absent on both sides, although the artery could be felt as a fine rounded cord. The reflexes and sensations of the lower extremities were normal. There were well-marked signs of a generalized arteriosclerosis. The urine had a specific gravity of 1.023; it contained a trace of albumin, no sugar. The symptoms presented by the cases shown were to be ascribed to an arteriosclerosis of the vessels of the leg and foot—the so-called dysbasia

angiosclerotica (intermittent claudication of Charcot). The X-ray photographs demonstrated by Dr. Holding showed very exquisitely deposits of lime in the posterior and anterior tibial arteries and the dorsalis pedis, marking out very definitely the course of the vessels. As might be inferred from the general evidences of arteriosclerosis in both cases, the pathological process in the pedal arteries was the usual arteriosclerosis of Gull and Sutton, with deposits of lime in the media. These cases are supposed to be less amenable to treatment than the endarteritis forms; hence this method of demonstration might have a certain prognostic value. Both cases had shown a very moderate response to treatment.

Dr. S. Sachs called attention to the similarity of the lesions met with in this condition to those of erythromelalgia.

A Case of Probable Infectious Myelitis of the Cervical Region, Following a Compound Fracture of the Jaw.—This also was presented by Dr. Hunt. The patient was a man thirty-six years old, a painter by occupation, who, until the onset of the present trouble, had enjoyed excellent health. He had never shown any symptoms of lead poisoning. On December 7, 1904, he fell on the street and fractured his lower jaw in two places. The fracture was a compound one, and the wound, which was on the inside of the mouth, bled for several hours. Three weeks later he had rigors at night, on one occasion followed by profuse perspiration. On January 5, 1905, after a heavy slumber, he awoke with severe pain in both arms, which were also very weak, so that he could hardly lift them. The weakness was chiefly in the muscles of the shoulder, especially on the left side. The pains continued all day with great severity, sharp and lancinating in character, and shooting through the whole length of the arms, although more severe in the shoulders. The next morning the pains had ceased entirely in the right arm, and the power of the extremity had returned. He was unable, however, to elevate his left arm, and the severe pains still continued, especially in the region of the left shoulder. There were no vesical symptoms. For several nights following the onset of the paralysis he had chills of moderate severity. The patient was first seen by Dr. Hunt on January 20, 1905, two weeks after the onset of the symptoms. He still complained of sharp, shooting pains in the region of the left shoulder, and the deltoid muscle was somewhat tender to deep pressure. It might be added, however, that on compressing the muscle bundles of the deltoid between the fingers, the same pain and tenderness was elicited as on deep pressure. The nerve plexus above the clavicle and in the axilla and along the inner side of the arm was absolutely free from any tenderness. The left arm was the seat of a slight general atrophy which was very marked in the deltoid muscle. All movements of the left arm and shoulder could be carried out with practically normal power, excepting adduction of the arm. On attempting adduction some of the posterior bundles of the deltoid were felt to contract, but little or no movement of the extremity was produced. All the arm-jerks were present, and were equal on the two sides. On testing the sensibility it was found that the tactile, pain and temperature senses were retained over both upper extremities, and that the deep sensibility was also normal. A more careful sensory test, however, showed that the sensation was relatively diminished for pain, temperature and touch along the outer side of the arm from the shoulder to the wrist, corresponding very closely to the recognized sensory distribution of the fifth cervical segment of the cord. On the right arm a similar relative obtunding of sensation was also present, but less marked and not so extensive, being practically limited to the region of the deltoid. The gross motor power and tendon reflexes of the lower extremities were normal. The Babinski phenomenon was absent. The deltoid muscle failed to respond at Erb's point to the galvanic or faradic current, although good contractions were produced in the biceps and the supinator longus. The direct faradic current produced a sluggish response in the posterior portion of the deltoid; no response in the anterior half. By the direct galvanic current a slow, vermicular response was elicited, with reversal of the poles. The urine contained some albumin and hyaline casts. A blood-count showed 4,112,000 red blood corpuscles; 10,000 white cells, and 75 per cent. of hemoglobin. The erethrocytes were normal; no granular basophilia. The differential count was as follows: polymorphonuclears, 70.6 per cent.; lymphocytes, 10.2 per cent.; large mononuclears, 18.8 per cent.; eosinophiles, 0; mast cells, 0.4 per cent.

On February 1, 1905, the patient still complained of a dull aching, with occasional sharp, shooting pains in the left shoulder. The moderate tenderness in this region still persisted. The gross motor power of the deltoid had greatly improved, so that the arm might now be elevated above the head. This occurred chiefly through the medium of the posterior half of the deltoid muscle, the anterior portion remaining entirely relaxed and flaccid. The slight sensory changes still persisted. There was no Babinski phenomenon. A small piece of dead bone had been removed from the inside of the mouth. The breath and excretions from the mouth were very fetid. The interesting features of this case, Dr. Hunt said, were those of localization and etiology. Considering the patient's previous good health, and the absence of any other demonstrable cause, it was natural to refer the symptoms to the suppuration and the carious process in the lower jaw, more especially as mild symptoms of sepsis directly preceded and followed the onset. While the persistent pains and apparent tenderness over the left deltoid might suggest a neuritis of the circumflex nerve, it might be emphasized that the paralysis of the deltoid was incomplete, and evidences of objective sensory changes limited to the circumflex were absent. The speaker also emphasized the absence of tenderness or other evidences of inflammation in the plexuses and cellular structures of the neck. On the other hand, the initial paralysis and severe pains, symmetrical and bilateral in distribution, the rather sudden recovery of the right arm and the more gradual recovery in the left; the unequal distribution of the paralysis in the left deltoid, and the gradual improvement which this paralysis had undergone; the relative diminution of sensation on both sides in an area corresponding very closely to that of the fifth cervical segment, all pointed strongly to a central cord lesion. The nature of this case could only be inferred. A poliomyelitis or a myelitis of infectious origin naturally suggested themselves.

Dr. Charles L. Dana said he had seen Dr. Hunt's patient some days ago, when there was still some paralysis of the left arm. The condition could best

be explained on the theory of a thrombosis, plugging one of the central arteries, and affecting the left anterior horn, about the region of the fifth cervical segment.

Dr. Fraenkel said there were a number of cases reported in literature where septic conditions, particularly that known as angina Ludovici—an acute suppurative condition of the connective tissues of the neck—had given rise to a septic neuritis. The speaker said he saw such a case in consultation about three years ago. The case was one of a septic throat condition, and eight or ten days later, after the acute symptoms had subsided, there were evidences of a bilateral brachial neuritis. It began with severe pain, in that way differing from the case shown by Dr. Hunt.

Address of the Retiring President, Dr. Pearce Bailey.—The speaker stated that while the membership of the Society had been materially enlarged during the past year, notably by younger men, the new members had not shown the active participation in the proceedings which was absolutely essential for the Society's continued prosperity. Many interesting cases had been shown during the year, and the general discussions had brought out large audiences, and had been fruitful in valuable information. While individual clinical cases and general discussions perfected the art of the clinician, they did not give neurology all that neurology had a right to expect from as representative a body as the New York Neurological Society. For the science to be advanced, more fundamental contributions were essential. It was commonly said, and with much truth, that neurology was living to-day on its past achievements. So much the more necessary was it to try to give it new life, to start it again on that progress which, only a few years ago, made it the most brilliant branch of medicine.

Address of the President-Elect, Dr. Joseph Fraenkel.—The speaker stated that while neurology had a glorious past, its future, viewed with the bias of the sentiment prevailing at present, appeared discouraging. A pessimistic attitude had crept in; the transactions of the meetings of neurologists seemed to lack the animation and enthusiasm of former days. Why this was so he did not know; it had happened because it had to—it was a phase of evolution. Dr. Fraenkel said that personally he did not believe that the present augured ill for the future. There was a wealth of fundamental questions awaiting investigation. New methods had been elaborated that promised valuable aid. Chemopathology, which seemed especially adapted for the elucidation of some neurological questions, with its promise of better therapeutics, was well established. The physiology of the ductless glands was closely allied to neurological themes, and deserved particular attention. All neurologists were thoroughly dissatisfied with our conception and interpretation of the so-called functional conditions. It was encouraging to note a decidedly rational spirit in the newer literature on the subject. The relation of the nervous system to the pathology of the vegetative functions was a subject which the speaker believed to be of fundamental importance to clinical neurology and psychiatry. The subject had not been lacking in votaries, but had proven refractory and unyielding. A good deal of preparatory work had been done for the better understanding of the subject. So-called visceral or vegetative phenomena accompanied more or less prominently organic disease of the nervous system, and constituted the chief physiognomy of all functional states and functional symptom-complexes. Trophic, vasomotor and secretory disturbances of the skin, changes in the trophism of joints and viscera, disturbances of the physiologic rhythm of the vaso- and visceromotor innervation, perversions of visceral sensation, were often seen at the bedside, and were not sufficiently appreciated. The visceral and vegetative symptoms of tabes and hysteria were good illustrations of familiar types. The innervation of the ductless glands was manifestly a matter of importance, and the histology of the blood-vessels of the brain and their innervation were morphological questions of broad application to physiology and pathology. Phenomena of disordered trophic influence were not uncommonly encountered by the neurologists, and very little was known about most of them. The palmar and plantar *mal perforant* of tabes, the cutaneous ulcerations of syringomyelia, the decubital ulcers observed in the course of organic disease of the cord or brain, the hysterical skin eruptions, the glossy skin, scleroderma, morphea, etc., were hardly understood. Atrophy of the hair of the limbs in tabetics, and hypertrichiasis in cases of poliomyelitis were frequently seen. It was interesting to observe that in cases of disease of the anterior horns, when the disease was limited to the anterior horn cells, as in amytrophic lateral sclerosis, for instance, this change in the growth of the hair did not take place. Atrophy of muscles severed from their connection with the peripheral nerves was frequently observed. Atrophy of visceral muscles under similar conditions was doubted. The trophic changes of the joints in tabes and syringomyelia, and the nature of arthritis deformans were still mysteries. The pituitary body was generally believed to exert trophic influence upon some parts of the skeleton. A large number of vasomotor disturbances were still puzzling problems. The general vasomotor ataxias observed so frequently in the course of Graves' disease, and the climacteric neuroses, were, on clinical grounds, referred to perverted function of the thyroid glands or of the ovaries, respectively. Angioneurotic edema was believed by many to be explained on the basis of a toxemia. The question of erythromelalgia was still *sub judice*. Sachs' and Wiener's findings of disease of the blood-vessels and peripheral nerves had been frequently corroborated. The condition was in danger of losing its clinical identity, and of being classed with the arterial diseases of the extremities (angina pectoris of the foot, intermittent claudication). For the explanation of the spasmodic disturbances of the respiratory function, asthma nervosum, tachypnea, dyspnea hysterica, little definite pathologic information was at hand. The bradycardia of direct and indirect vagal lesions was frequently described. According to Oppenheim, neuritis of the vagus was indicated by acceleration, rarely by slowing of the heart beat. The vast variety of symptoms referable to disordered innervation of motion, sensation and secretion of the gastro-intestinal tract were well known and often very perplexing. Cases of cord lesions were not infrequently met with which began with visceral, particularly gastro-intestinal symptoms, and which were often treated for a long time under this mistaken diagnosis. In a large number of cases of lead colic the celiac nerves and ganglia were found evidently diseased. Changes in the constitution of the urine were frequently observed in

nervous diseases. Albuminuria was often a symptom of a pontine lesion, while glycosuria was frequently associated with disease of the posterior fossa. The symptomatology of disordered genital functions was also beginning to be studied along the lines suggested in Dr. Fraenkel's paper.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.[1]

Tenth Regular Meeting, held February 15, 1905.

The President, S. J. Meltzer, M.D., in the Chair.

Members Present.—Atkinson, Auer, Burton-Opitz, Dunham, Ewing, Flexner, Gies, Jackson, Lee, Levene, Levin, Mandel, Meltzer, Noguchi, Norris, Oertel, Opie, Park, Richards, Sweet, Wadsworth, Wallace, Wolf, Yatsu.

Members Elected.—George W. Crile, Haven Emerson, Cyrus W. Field, Hideyo Noguchi, H. C. Sherman, J. Edwin Sweet, Victor C. Vaughan.

Officers Elected.—President, Edmund B. Wilson; Vice-President, Edward K. Dunham; Librarian, Graham Lusk; Treasurer, Gary N. Calkins; Secretary, William J. Gies.

ABSTRACTS OF REPORTS OF ORIGINAL INVESTIGATIONS.

Degrees of Susceptibility to Diphtheria Toxin among Guinea-Pigs. Transmission from Parents to Offspring.—by Theobald Smith. (Presented by William H. Park.) Dr. Smith called attention to the usefulness of the antitoxin unit furnished by the Institute for Experimental Therapy under the direction of Professor Ehrlich in the routine testing of the strength of diphtheria antitoxin. The one uncertain element is the relative resistance of the guinea-pigs to diphtheria toxin. In the course of the past nine years the writer has given considerable personal attention to this subject, and found that different dealers furnished guinea-pigs of slightly different susceptibility. This difference was attributed to environment and care. The animals bred under the writer's supervision generally showed maximum resistance. Irregularities in the routine tests during the past year led the writer to look up the genealogy of the pigs used and he found that the different degrees of resistance belonged to certain families or litters and were constant for those families. Thus one mother gave birth to young which did not react to what was the usual fatal dose. Four successive litters possessed the same resistance. As each pig could be tested but once the precise degree of resistance could not be measured, but it appeared probable that this family could stand forty per cent. more toxin when mixed with the antitoxic unit than those of average susceptibility. Other mothers were traced whose offspring possessed less resistance than the ones described but could still neutralize 20 per cent. more toxin when mixed with the antitoxic unit than the average.

It would seem from these observations that different degrees of susceptibility to toxin are to be found among guinea-pigs, and that the special degree possessed by any one is not to be attributed to individual variation but to a family trait or character. The resistance in the cases cited could not be attributed to any preliminary treatment with toxins and antitoxins.

Experiments are now under way to determine the part played by the male in the transmission of toxin-resistance. In the case of the most resistant family, the four litters were the offspring of two males.

The Protective Action of Venom Upon Blood Corpuscles, with Demonstrations.—By Hideyo Noguchi. (Presented by Simon Flexner.) That concentrated solutions of venom fail to destroy and tend to preserve blood corpuscles was noted by Mitchell and Stewart. Among the recent writers who have paid especial attention to the interpretation of this phenomenon are Kyes and Sachs. They ascribe it to deviation of the hemolytic complement through the excess of venom amboceptors. The study which forms the basis of this brief communication shows the hypothesis of Kyes and Sachs to be untenable, since it could be demonstrated that (1) the protective action fails to occur with venom in which, through heating to from 95° to 100° C., the hemolytic principle has been preserved, but certain other constituents have been coagulated, and (2) the action extends to protection of the corpuscles from laking by water, ether, saponin, etc. The conclusion which has been reached by the author is that venom unites with the globulins and especially with the hemoglobin of the red corpuscles, yielding a water-insoluble compound to which the protection is due. Various substances, but only salts, acids and alkalis, restore the hemolyzability of the corpuscles by dissolving the venom-hemoglobin compound. The permeability of the corpuscles is not markedly altered.

The Results of Attempts to Cultivate Trypanosomes from Frogs. A Preliminary Report.—By Joseph Lewis and Herbert U. Williams. (Presented by Augustus B. Wadsworth.) During the year 1904 an effort was made in the pathological laboratory of the University of Buffalo to make studies on hematozoa in the lower animals. In a considerable number of normal cats, dogs, rabbits and guinea-pigs no hematozoa were found. The other examinations were as follows: 51 English sparrows (*Passer domesticus*), half in the winter, half in the spring, all negative; 27 mudpuppies (*Necturus maculatus*) in March, all negative; 40 toads in the summer, all negative. In 140 frogs from the Niagara River, there occurred the following infections; 14 with *Trypanosoma*, 5 with *Drepanidium*, 1 with *Filaria*. *Drepanidium* was found both in the summer and fall. The infections with *Trypanosoma* were distributed as follows:

In July of 15 frogs, 2 showed trypanosomes.
In August of 25 frogs, 10 showed trypanosomes.
In September of 14 frogs, 2 showed trypanosomes.
From October to December of 85 frogs, 0 showed trypanosomes.

In one case *Trypanosoma* and *Drepanidium* occurred in the same blood. The trypanosomes had the usual characters of *Trypanosoma rotatorium* (*ranarum*). They were in no case numerous; two were rarely seen in one low-power field. The frogs appeared healthy. Eight attempts to inoculate normal frogs by way of the peritoneum with the blood of infected frogs gave negative results.

Attempts at Cultivation.—The blood of frogs and toads was taken to make blood-agar (used by Novy and MacNeal for the cultivation of trypanosomes). The blood was first examined carefully to see that it was free from parasites. The animal was etherized and placed in $HgCl_2$ solution 1 to 1,000 for fifteen minutes, rinsed in distilled water, opened with all precautions, the blood from the heart taken with a sterile pipette, and mixed rapidly with the water of condensation on slanted agar tubes (made with meat extract and peptone, and slightly alkaline to litmus). Two or three drops of blood were used for each tube. The tubes were

[1] Proceedings reported by the Secretary, William J. Gies, Ph.D., of New York. The authors of the reports have written the abstracts. The Secretary has made a few abbreviations.

sealed with rubber stoppers and allowed to stand five to ten days so that contaminations with bacteria might be detected.

(1) The blood of frogs infected with *Trypanosoma rotatorium*, collected in the same manner, was mixed with that in blood-agar tubes prepared and tested as just mentioned. The tubes were kept at the temperature of the room. Cultures made from two infected frogs showed, after two weeks, growths of flagellate protozoa (both on toad's blood-agar and frog's blood-agar). The organisms were of a very long oval form, the bodies of the largest being 2 μ x 18 μ. There was a single flagellum, which was often nearly as long as the body. Only the largest forms showed a trace of an undulating membrane, which never approached the development of this structure in *Trypanosoma rotatorium*, and which did not appear in stained preparations. Motility was not very pronounced. Numerous small forms were seen evidently representing various developmental stages. In preparations stained according to Romanowsky a blepharoplast (micronucleus, centrosome) was seen at the base of the flagellum and near the *anterior* end. The nucleus appeared to be represented by numerous chromatin granules in the posterior end. It may be noted that Smedly (*Journal of Hygiene*, January, 1905) found the centrosome at the anterior end in the cultural forms of the rat trypanosome. Numerous observers have seen trypanosomes lacking the undulating membrane under artificial conditions. The growth in the tubes was never luxuriant. Arrangement in rosettes was not seen. One generation only of subcultures grew. All the cultures soon died. A single attempt to inoculate a normal frog gave a negative result. These experiments were interrupted, as both the authors went out of town.

(2) As is mentioned below, the blood of frogs infected with *Drepanidium* was added to frog's blood-agar tubes to see if *Drepanidium* could be made to live or undergo further development. Tubes thus inoculated, in one case, showed trypanosomes in about ten days. For the moment it appeared as though trypanosomes had developed from *Drepanidium*. Having some of the same blood-agar to which no *Drepanidium* blood had been added, this was examined again and found to contain the same trypanosomes. They must of course have been derived from the frog from which the blood-agar was made. The frog's blood was examined for parasites before using it to make the medium and just before inoculating it, so that trypanosomes must have been present in numbers too small to show in several large cover-glass preparations, or they existed in some developmental stage not recognized. Novy and MacNeal have also secured cultures of trypanosomes from birds, where none were found by direct examination of the blood with the microscope.

In some preparations from the blood-agar tubes as many as four trypanosomes appeared in one field (Zeiss D.D., No. 3 ocular), and there can hardly be any doubt of their having multiplied. The motion of the trypanosomes was active and characteristic. They were much smaller than *Trypanosoma rotatorium* with rare exceptions, the body being usually about 3 μ x 16 μ. The flagellum was hardly half as long as the body. On the small forms the undulating membrane was not distinct, but the flagellum was plainly marked. Large forms similar to *Trypanosoma rotatorium*, except that the flagellum was lacking, occurred but were rare. The nucleus and blepharoplast were placed as in *Trypanosoma rotatorium* as far as could be determined, but the amount of material was so small that satisfactory stained preparations could not be secured.

With trypanosomes there were associated spindle-shaped or crescentic bodies, about 12 μ in length, looking much like the crescents of æstivo-autumnal malaria except for lack of pigment. These bodies contained several (usually four) shining chromatin granules symmetrically placed in the midddle. Motility was doubtful and in any case slight. Flagella were not seen. The crescentic forms were probably some developmental stage. The crescentic bodies were observed for eight weeks. Motile trypanosomes were observed for five weeks. No growth occurred in subcultures. Two frogs were inoculated by way of the peritoneum from tubes containing the crescentic bodies, with negative results.

(3) Attempts to produce development of *Drepanidium* were made from three frogs infected with this parasite, both on frog's and toad's blood-agar. The results were negative, although motile *Drepanidia* were discovered after ten days, and the parasites remained for weeks apparently unaltered within the blood-corpuscles.

Conclusions.—Trypanosomes from the frog may be cultivated on blood-agar, but, in the authors' experience, with considerable difficulty. From a frog infected with *Trypanosoma rotatorium* a flagellate organism was cultivated, showing important points of difference from *Trypanosoma rotatorium*. It is possible that, owing to the technical difficulties of the experiment, some other organism may have found its way into the tubes. This is improbable.

Undoubted trypanosomes developed in blood-agar prepared from a frog whose blood, during life, showed no trypanosomes. They resembled *Trypanosoma rotatorium*, but were usually much smaller. As this blood-culture medium was inoculated with blood from another source containing *Drepanidium*, it nearly led to the conclusion that *Trypanosoma* might develop from *Drepanidium*. We have here an illustration of the ease with which mistakes may occur in the cultivation of hematozoa which are suspected of passing through cycles. Such a possibility had been pointed out in advance by Novy and MacNeal before this Society (October, 1904).

There was no evidence from our experiments to show that development of *Drepanidium* can occur on blood-agar.

It is unlikely that material with which further studies may be made can be secured before next summer. As trypanosomes are now exciting so much interest and are being so widely studied, the authors deemed it best to report their results, although the work is incomplete.

Experimental Measles.—By Ludwig Hektoen (Presented by Eugene L. Opie). The search for the cause of an infectious disease like measles becomes greatly simplified when we learn how to secure the unknown "virus" in relatively pure form unmixed with common microbes. Various methods may now be applied to the investigation of the virus. The transmission of measles from mother to fetus would seem to point to the presence of the cause of the disease in the blood. In the twenty cases of fetal measles collected by Ballantyne, it seemed that the infection of mother and fetus must have been simultaneous because the eruption in both corresponded in character. In order to learn something further as to the presence in the blood of the cause of measles, inoculations of human beings would seem to be necessary because, so far as we now know, this disease is probably not communicable to animals. Grünbaum's experiments with measles in the chimpanzee appear to have given negative results.

Critical review of the literature shows that almost without exception the recorded experiments in the

inoculation of measles, for which positive results have been claimed, are without real significance. The claims that the experiments of Home, of Wachsel, of Speranza, of Katona, of McGirr, of Bufalini, gave definitely positive results do not stand close scrutiny in the light of the evidence at hand. In many instances the rubeolous nature of the sickness, sometimes very mild, following the inoculation and regarded by the experimenters as measles, is not at all securely established, and in practically all cases the possibility of natural infection has not been excluded. These experiments, practically all of which were undertaken with the idea of producing a modified form of the disease, consequently permit no conclusion as to the infectiousness of the blood or other substances in measles. If we accept Mayr's results as they are given by him, it may be concluded that in measles, nasal mucous and cutaneous scrapings (containing blood, epithelial débris, and tissue juices) may contain the cause of measles at or near the height of the eruption.

In the following experiments the author tried to determine whether or not, in measles at the height of the attack, the blood contains the cause of the disease. In these experiments special care was taken to exclude natural infection.

1. The blood injected was taken from a boy of nine years who, in the later stages of desquamation after an uncomplicated attack of scarlet fever, developed a rather mild but typical attack of measles. The first symptoms of measles appeared after he had been free from fever for about two weeks. There was headache, coryza, cough, running of the eyes, and mild febrile symptoms. Three days later a papular eruption was noted, and on the fourth day a typical rubeolous rash was present that soon began to fade and was followed by typical branny desquamation.

On the fourth day 4 c.c. of blood were withdrawn from the vein at the right elbow after carefully scrubbing the skin with soap and water followed with alcohol. Two flasks with ascites broth 50 c.c. (peptone broth two parts, ascitic fluid heated to 55° C. for forty-five minutes one part) were inoculated[1] at once with 1 and 3 c.c. of blood respectively and placed in the incubator at 37° C. for twenty-four hours. At the end of this time both flasks appeared sterile, the corpuscles having settled, the supernatant fluid being clear. Subcultures made at this time upon ascites agar, glycerin agar and Löffler's serum and kept under ærobic and anærobic conditions remained sterile; and the contents of the flask of ascites-broth containing 1 c.c. of blood remained permanently sterile.

Four c.c. of the flask of 50 c.c. of ascites-broth mixed with 3 c.c. of blood and kept in the incubator at 36° C. for twenty-four hours were injected under the skin of the chest of a healthy medical student twenty-four years old, just finishing desquamation after an uncomplicated attack of scarlet fever, and who readily gave his consent to the experiment. This man was not in the same hospital as the boy furnishing the blood for injection, but had been for twenty-six days in a different institution, at that time as well as before and afterward entirely free from measles.[2] So far as could be learned, and careful inquiry was made, the man injected had not had any disease at all resembling measles except scarlet fever. At no time did any local symptoms appear at the site of the injection. On the thirteenth day after injection the temperature was 101° F.; in the evening it rose to 103° F. At nine o'clock the following morning he was given a warm bath and immediately afterward a red, papular, blotchy eruption broke out on the forehead and spread quite rapidly to the face, neck and chest. Dr. James B. Herrick, who saw him at this time, felt no hesitancy in making the diagnosis of measles. By two o'clock an unmistakably typical full blown, rubeolous rash was present over the greater part of the body. The temperature remained above normal for two days, when it fell to normal about the same time that the eruption began to fade. An uneventful recovery followed without any complications whatsoever, the desquamation being branny. There was during the entire illness freedom from respiratory symptoms of all kinds. Even during the pre-eruptive period there were no special local symptoms (morbilli sine catarrho). The patient's subjective condition was not much changed if at all at any time during his illness. The appetite continued unimpaired.

2. In this case the blood was furnished by a well-developed Irish servant girl, twenty-one years old, who passed through an uncomplicated attack of typical measles. About thirty hours after the earliest appearance of the rash, which still was coming out upon the extremities, 10 c.c of blood were withdrawn from a vein at the elbow and distributed equally among four flasks, each containing 50 c.c. of broth and 25 c.c. of ascites fluid. These flasks all remained perfectly sterile so far as bacteria demonstrable by the usual methods are concerned.

After twenty-four hours at 37° C., 5 c.c. of the mixture of blood in ascites-broth were injected subcutaneously in the back of M., aged twenty-eight years, who had not had measles so far as he knew and who readily gave his consent to the experiment. This patient was also recovering from a mild attack of scarlet fever and had been at time of inoculation for twenty-four days the sole occupant of the isolation room of a general hospital in which at that time there were no other cases of measles. There were no local changes at the site of the injection. The temperature and general condition remanied normal until the evening of the eleventh day, when the temperature rose to 99.8° F., and the next day a mild conjunctivitis already suspected a day or so previously became definitely apparent. On the thirteenth day there was some cough, the tonsils were bright red, and there was an increased amount of mucus in the throat. In the afternoon the temperature, which was rising, reached 103° F. During the next night a typical rubeolous eruption came out, the first spots being noticed on the nose and then on the forehead, face, scalp, chest, back and abdomen. The rash consisted of pink macules and papules which disappeared readily on pressure, being largest and brightest red over the face. The forehead was quite uniformly red. The patient was not seriously ill; there was some loss of appetite, but he slept well during the night, having been somewhat restless the preceding night. Recovery was prompt.

Cultures of the blood on the thirteenth day (1 c.c. of blood in each of three flasks each containing 50 c.c. of broth and 25 c.c. of ascites fluid) remained permanently sterile.

Conclusions.—The results of these two experiments permit the conclusion that the virus of measles is present in the blood of patients with typical measles sometime at least during the first thirty hours of the eruption; furthermore, that the virus retains its virulence

1 In experiments 1 and 2 a few drops of blood were allowed to run out before inoculating the ascites-broth which was done without the needle of the syringe touching the culture fluid.

2 In both experiments the injections were made by me. At the time the injections were made I had not seen any cases of measles within twenty-four hours. When in the measles ward the usual precautions were used and of course similar precautions were followed when visiting the subjects of the experiments—clean long gowns, caps, clean hands, etc. Freshly autoclaved syringes were used for the injections.

for at least twenty-four hours when such blood is inoculated into ascites-broth and kept at 37° C. This demonstration shows that it is not difficult to obtain the virus of measles unmixed with other microbes and in such form that it may be studied by various methods.

The Formation of the Centrosome in Enucleated Egg-Fragments.—By Naohidé Yatsu. To test whether the centrosome is a permanent cell-organ or not, E. B. Wilson (1901) made an experiment on the sea-urchin egg by treating, with a salt solution, enucleated egg-fragments obtained by shaking. He observed that asters containing centriole and capable of division were produced in the enucleated fragments. He, therefore, came to the conclusion that at least some of the centrioles in the asters thus formed must have arisen *de novo*. Some writers criticised his results, saying that the formation of the centrioles in the enucleated fragments observed by him might have been due to the shaking-out of the nuclear fluid into the cytoplasm. Wilson, therefore, suggested to the author to repeat his experiment in a somewhat different manner; instead of shaking, to cut eggs singly and to treat the nucleated and enucleated pieces separately. The author tried this experiment on the egg of *Cerebratulus* in the summers of 1903 and 1904. Strict precautions were taken to prevent accidental fertilization, everything used for the experiment being sterilized. Individual eggs were cut into nucleated (*i.e.*, containing the first maturation mitotic figure) and enucleated fragments. The latter were kept for an hour in a solution of calcium chlorid. Then they were transferred to sterilized sea-water. Asters were produced in almost all enucleated fragments thus treated. What is more striking, all the asters had centrioles which were identical with those found in the whole eggs subjected to the same treatment. The nucleated half was stained and shown to have had two original centrosomes intact. From these experiments no other conclusion can be drawn than that the centrosome, with centriole, of the enucleated fragment was formed *de novo*.

Structure of Vaccine Bodies in Isolated Cells, with Demonstrations.—By James Ewing. One of the few points on which all observers of vaccine bodies are agreed is that these structures are extremely susceptible to artificial changes. The author has for some years endeavored to find a method of examination of these bodies by which artificial changes could be avoided; and this object seems to have been accomplished by the very simple procedure of making Klatsch preparations of corneal vaccine ulcers.

A glass slide is cleaned with soap and water, and thoroughly heated in a Bunsen flame. It is then found to be unusually cohesive. The cornea of an anesthetized rat or rabbit, presenting a vaccine ulcer at any stage, is exposed by holding back the eyelids and protruding the eyeball. The cooled slide is then lightly applied to the ulcer and quickly withdrawn without lateral motion. The slide carries away with it an impression of the ulcer in the form of isolated cells or groups of cells loosened by edema. In this way ten to twenty impressions may be taken in serial order, and the minute ulcer may be completely excavated without sacrificing the animal. The isolated cells dry instantly and may be fixed by gentle heat, and afterward by methyl alcohol, and then stained by various methods, preferably by Nocht-Romanowsky for ten minutes. The vaccine bodies are then presented with a clearness equal to that of the malarial parasites in blood spreads.

In Klatsch preparations stained by Nocht's method the following features of the vaccine bodies appear to be demonstrated. The vaccine body is a portion of the cytoreticulum, its reticular structures being continuous on the one hand with the cytoreticulum and on the other usually with the nuclear reticulum. The clear zone surrounding the vaccine body in sections of tissue is an artifact. The reticulum of the vaccine body takes the chromatin stain indicating that it contains chromatin; and many of the bodies are so intimately connected with the nucleus, the meshes of one passing insensibly into the other, as to force the conclusion that these particular bodies have arisen by recent extrusion of nuclear chromatin into the cytoreticulum. Other bodies are disconnected from the nucleus and these may have arisen partly from the chromatin of the cytoplasm, a possibility which is furnished by Hertwig's theory of the constitution of cell protoplasm. Many of the vaccine bodies closely resemble the chromidial substance described by Hertwig in some lower animal cells. In the meshes of the reticulum the author has been unable to demonstrate any organized structure, but the meshes sometimes present nodal points of an underlying reticulum. In the fresh condition the meshes contain homogeneous refractive globules which disappear on drying.

Two series of changes may be followed in the vaccine bodies in Klatsch preparations. Many of them develop basic staining areas with loss of the central reticulum, and this process may continue until the entire body is transformed into a homogeneous globule resembling mucus or colloid. In others the reticulum breaks up into granules with or without the development of a central basic mass.

The author has been unable at any stage or in any derivative of the vaccine body to detect the slightest definite trace of a protozoon. Yet there are several hypotheses on which it may be claimed that this cytoplasmic and nuclear material harbors an organized virus of vaccinia. (1) The meshes of the reticulum may contain a submicroscopic organism or one which disappears on drying. (2) The vaccine body may represent a fusion of the protoplasm of the host cell with that of the parasite, forming a *mycoplasm*, as is claimed to exist in some diseases of plants (wheat-rust). (3) Some other method of fixation and staining of isolated cells may succeed in demonstrating in the meshes of the vaccine body an organized structure. In any event it must be claimed that if the vaccine body contains a parasite it is one quite different from any recognized type of protozoon or from any interpretation which has yet been placed upon the structure of vaccine bodies in sections of tissue.

Besides vaccine bodies there are other structures resembling protozoa to be seen in Klatsch preparations. One of these is ½ to 1½ μ in diameter, ring-shaped and containing a chromatin granule. Myriads of these bodies are sometimes visible on the flat corneal cells. They appear to be peculiar cell granules and are present in normal animals.

On the Tetanic Element in Bile.—By S. J. Meltzer and W. Salant. The toxic effects of bile are manifold and have been the subject of numerous investigations. The authors referred only to the general effects: coma and convulsions. Of the early investigators of the effects of injection of bile into animals, some observed only coma, others convulsions and still others stated that they observed both. The last work on this subject, the work which is now frequently quoted, was done by Rywosch about fourteen years ago. Rywosch claims that coma is the only effect of the two which the injection of bile or bile salts produces.

In their extensive series of experiments on frogs the authors established the fact that the injection of bile can

produce coma as well as tetanus. Coma is the frequent and the more reliable result. By a certain device, however, they were able to demonstrate the presence of the tetanic element even in bile which infallibly produced coma; it was by the addition of a subminimum dose of strychnine. A frog of medium size will not respond, even with the slightest hyperesthesia, to an injection of one hundredth of a milligram of strychnine. When such a small dose, however, is injected into a frog, which has received a certain quantity of bile, the animal reacts sooner or later, with a distinct tetanus. The effective dose of bile varies with the animal from which it is obtained. For instance, of ox bile hardly more than 0.3 c.c. need be used, otherwise the coma will completely mask the tetanic element. Rabbit's bile, on the other hand, may be given, sometimes even in doses of 2 or 3 c.c., without suppressing any of the tetanic features. The setting in of complete coma usually masks the tetanic element as already stated. A close observation however will reveal in many cases some distinct differences between the coma of animals which received a subminimum dose of strychnine and that of animals which had not received any strychnine.

The bile of rabbits, which thus far has been more extensively studied than that of other animals, produced in many instances distinctly convulsive effects even without the addition of strychnine. From an analysis of their observations to the present time the authors feel justified in making the following statements: The toxic effect of bile from normal rabbits shows an individual variation; the effect of the bile from some of the animals is predominantly coma and from others tetanus. Heating the bile seems to reduce the stupefying, paralyzing effect and to favor the appearance of the tetanic element. In the bile of nephrectomized rabbits the tetanic element was distinctly more pronounced than in the bile of normal rabbits.

The bearing which these observations might have upon the understanding of the complex symptoms of cholemia and uremia was not discussed.

A Preliminary Communication on the Pharmacology of Thorium.—By E. D. Brown and Torald Sollmann (Presented by William J. Gies). Thorium nitrate precipitates proteids and is intensely astringent. Its intravenous injection is promptly fatal by embolism. Applied subcutaneously, it causes local necrosis. Administered by the stomach, even large doses have no appreciable effect.

Solutions in sodium citrate were found to be non-precipitant and non-astringent. As much as 1 gm. of thorium nitrate, per kilogram of dog, injected subcutaneously and intravenously, in citrate solution, had little acute action; however, the animals appeared depressed and became emaciated. The post mortem examination, made after several weeks, showed extensive and widespread calcification of tissues. Thorium could not be demonstrated in the calcified areas.

A method for the quantitative estimation of thorium was elaborated; this gave satisfactory results with urine to which known quantities were added. But in actual experiments on animals it was found inaccurate, a large proportion of the injected thorium escaping detection. However, it was found that on intravenous or subcutaneous injection, the thorium appeared in the urine and not in the feces. When administered by mouth, it appeared in the urine, but not in the feces. The conclusion appears justified that absorbed thorium is excreted by the kidneys, but that the metal is neither absorbed nor excreted through the intestine.

A Preliminary Study of the Toxicological Action of Thorium.—By Arthur F. Chace and William J. Gies. Our experiments comprised the third series in a study, still in progress, of the toxicology of rare elements.[1] They were 27 in number and were performed on as many animals (frogs, mice, dogs). They were carried out before Baskerville's announcement of his discovery that thorium consists of *two* elements, named by him *berselium* and *carolinium*. Publication of our results was deferred because of our desire and intention to complete the work with a study of the toxicological effects of these two new elements, which Prof. Baskerville has generously agreed to furnish at a later stage in his investigation. The foregoing communication by Prof. Sollmann has induced us, however, to present here our results as they stand. In some of the early experiments (1900) it was found that thorium (nitrate) had a uniform precipitative effect on various connective tissue mucoids. In our study, with Prof. Loeb (1902), on the antitoxic influence of ions, thorium (nitrate) was used as a tetravalent element, and was found to exert only very slight almost inappreciable antitoxic effects in 5/6 *m.* NaCl, with fertilized fundulus eggs as the indicators. At that time we observed the strong precipitative effect of thorium on protoplasm, and the marked toxicity on various fishes and on both fertilized and unfertilized *Fundulus* eggs in sea water, although these facts were not recorded in our paper.

In the experiments on frogs and warm-blooded animals the tetra-chlorid was used exclusively. Of our results the following were in harmony with those reported by Brown and Sollmann: Thorium exerts marked astringent action. The chlorid is acid in reaction (in water). The aqueous solution of the chlorid blanched and hardened tissues, proteids were precipitated by it, and blood not only precipitated but blackened. Injected directly into the circulation even very small doses caused intravenous precipitation and resulted fatally. Subcutaneous injection resulted in local necrosis. Thus far we have not had any experiments with thorium in citrate solution or on the excretion of thorium.

The following results extend the observations reported by Brown and Sollmann:

(1) In frogs weighing about 25 grams no effect was observed after introduction per os, when less than 40 milligrams was introduced. This amount caused only slight symptoms. Subcutaneous injection of 40 milligrams caused death in about sixty hours. Injection of the same amount per rectum appeared to be more quickly followed by toxic results than when introduction occurred through either of the former channels. Introduction per os caused irritation of the throat, increased gastric secretion, ejection of gastric contents and increased peristalsis. It required per os approximately 1.5 gram per kilo to produce general toxic results, among which were anhydrosis, twitching and progressive weakening of the muscles, with paralysis of the forelegs preceding paralysis of the hind ones. In fatal cases the reflexes were abolished in the usual order. The general toxic effects after introduction subcutaneously or per rectum were about the same as those following introduction by way of the stomach.

(2) In *warm-blooded animals* (mice and dogs) relatively large doses administered subcutaneously caused restlessness, twitching of the muscles, progressive paralysis, labored breathing, stupor, death. Paralysis of the forelegs preceded loss of power in the hind legs. Injection of 5 grams of the chloride into a dog weighing 15 kilos failed to cause death. Ingestion of 2 grams, with 100 grams of meat, by a dog weighing 6 kilos, was followed in two hours by vomiting. The ejected matter was gradually eaten during the next few hours,

[1] We have already reported our observations on the toxicology of tellurium (1900) and of selenium (1902).

with no other apparent effect thereafter than loss of appetite and increased desire for water.

(3) The most constant and pronounced general effect of the tetra-chlorid of thorium was a progressive weakening of all the voluntary muscles.

MEDICAL AND CHIRURGICAL SOCIETY OF MARYLAND.

Regular Meeting, held January 20, 1905.

Pulmonary Stenosis.—Dr. Darling showed the heart of a patient who had died suddenly from violence and hemorrhage. There was stenosis and insufficiency of the pulmonary valve but no potent foramen ovale or ductus arteriosus. Thickening of the whole heart wall was extreme.

Flint Murmur in Ulcerative Endocarditis.—The murmur described by Flint in 1862 had, Dr. Thayer said, been heard in about fifty per cent. of the cases of pure aortic insufficiency seen at the Johns Hopkins Hospital; it was not, however, common to find it in ulcerative endocarditis. Four such cases he reported, the patients showing symptoms of ulcerative endocarditis with a presystolic murmur and the autopsy findings revealing no mitral lesions. It was easy to see how the anterior mitral curtain, practically continuous as it was with the aorta, vibrated with aortic regurgitation; and the attachment of the papillary muscle (which arose from the anterior curtain) being just above the apex might account for the thrill and murmur being most intensely heard at that point. The diagnosis of Flint murmurs was by no means easy. If, with aortic insufficiency a moderate mitral stenosis murmur was heard but no shock or snapping first sound suspicion of Flint murmur should be aroused. The pulse, too, did not have the "mitral" characters.

Paroxysmal Tachycardia.—Dr. Gamble reported an obscure heart case. The patient had had his attention called to his heart in boyhood by his physician and had always lived around its beats. Attacks of fluttering with changes in disposition, which varied with the character of the pulse, were the prominent features of the case. The physical signs were variable, signs of myocarditis with congestion of the liver and edema of the feet gradually developing. There was no pain, but attacks of apparent angina occurred with fair frequency. At autopsy fibrous myocarditis, sclerosis of the coronaries, and a mural thrombosis of the left ventricle were found. Many diagnoses had been made on this case and it illustrated the great difficulty of the diagnosis of myocarditis in the early stage. Dr. Thayer emphasized the importance of making patients exercise during the examination of the heart; a murmur which developed under exercise was suspicious.

Malnutrition in Children.—Dr. Kilmer, of New York, read a paper on this subject. The first cause of the condition was, he said, parental ignorance. The healthy conditions with which the parents of present parents had surrounded them during childhood had been forgotten. Breast milk was being superseded by condensed milk and patent foods. Education was begun too early, "higher education" was being overdone, the great social demands made on mothers were taking them away from their children. The second cause was found in disease of the children. Adenoids and tonsils were familiar examples. Disease of the parents was the third cause. This was most often lues, an old chancre in the father sometimes expressing itself in the child, as malnutrition without other symptoms. If other treatment was tried without result lues should always be suspected and mercurials and iodides (both borne well by children) should be ordered. In the general treatment, good sleeping room, plenty of fresh air, suitable bedclothing, medium underclothing, plenty of exercise and a warm bath once a day should be provided. School should not be begun until the seventh year. A daily nap should be taken, and the child should sleep from 6.30 P.M. to 7.30 A.M. Food should be high in proteids and poor in carbohydrates, and the stomach should be carefully treated. Iron, quinine, sherry and cod-liver oil were important drugs for malnutrients. Malnutrition should always be eliminated in the diagnosis of obscure cases. Dr. Rührah referred to the fact that comparatively little metabolism work had been done on children, though in infancy and adult age it had been well worked up. Probably in these patients it was not a case of poor absorption from the intestines but there was some break after assimilation, between that and excretion of end-products. A somewhat analogous condition was seen in diabetes. Dr. Mitchell said that the general environment was most important, and compared with it adenoids, etc., relatively insignificant. Dr. Kilmer said that feeding was overcarefully done up to the end of the first year and after that neglected.

BOOK REVIEWS.

How to Study Literature. By B. A. Hexdrick. Hinds, Noble & Eldredge, New York.

This manual aims to facilitate the study of literature by means of outlines with suggestive questions arranged for the different classes of literature, narrative, lyric and dramatic poetry, the essay, the oration and prose fiction. The application of these outlines is aided by specimen studies in which they are employed, and an excellent list of suggested reading appears as an appendix. Versification and figures of speech are briefly treated in other appendices.

Report of the Government Hospital for the Insane to the Secretary of the Interior, 1904. Washington Government Printing Office.

This modest volume is a model of clearness, conciseness and interest, a report that really reports. From it one may gather a genuine appreciation of the vast work, pathological and executive, which is accomplished at the Government Hospital, and of some of the difficulties which it has to encounter. A number of excellent half-tones of the buildings add to the interest of the report, and the elaborate statistic tables are readily get-at-able for any information needed. Altogether the management of the hospital is to be congratulated upon its success in presenting its work to the public in such an effective way.

In the Year 1800, Being the Relation of Surgery Events occurring in the Life of Doctor Jonathan Brush during that year. By Samuel Walter Kelley, M.D. Vol. III. The Doctor's Recreation Series. The Saalfield Publishing Company, Chicago, Akron, O., and New York.

This, the third volume of the Doctor's Recreation Series, purports to be an arrangement of a package of old papers rolled in a leathern wrapper tied with a strip of the same material and marked in scarcely legible characters "The Property of Dr. Jonathan Brush, Private," which fell into the hands of a modern doctor. He found

them to contain not what too many doctors leave as their sole legacy to posterity, a collection of unpaid accounts of unpaid services, nor yet, as I half expected, clinical records of cases in practice, but a fairly connected narrative of events that transpired during the year 1800. It is really a story that brings out the features of the practice of medicine and surgery, with an account of a social status of the profession at that time, which will undoubtedly prove interesting reading, especially for those, and they are fortunately growing in number, who have acquired an interest in the old things of medicine. Many familiar names come into the book and it is very cleverly put together.

THE SURGERY OF THE DISEASES OF THE APPENDIX VERMIFORMIS AND THEIR COMPLICATIONS. By WILLIAM HENRY BATTLE, F.R.C.S., Surgeon to St. Thomas' Hospital, Formerly Surgeon to the Royal Free Hospital, etc., and EDRED M. CORNER, M.B., B.C., F.R.C.S., Surgeon-in-charge of out-patients to St. Thomas' Hospital, Assistant Surgeon to the Great Ormond Street Hospital for Sick Children, etc W. T. Keener Company, Chicago.

THIS little book from the skilful hand of one of the originators of the most frequently used abdominal incision,—the Kämmerer-Battle,—is certain to be very welcome to all. The authors have endeavored to summarize briefly the conflicting views of the physician, the pathologist and the surgeon, and have tried in an impartial way to place before the profession, the surgeon's views and conclusions in this very important malady. The book is rendered further interesting and valuable by having appended a most interesting and lucid chapter on the "Acute Abdomen" and one on life insurance in its relation to appendicitis. The authors are strict adherents to that school which advocates the wet method of treating peritonitis and that chapter on the subject is fraught with particular interest. Their notes on concretions and the rôle which they play as causative factors in appendicitis are interesting and concise. Considerable attention is devoted to the mode of formation of these concretions, the authors concluding that micro-organisms play an all-important factor. One cannot ask for everything in such a small book, but it may be permissible to suggest that in a future edition the distinguished authors will devote more attention to a consideration of the still unanswered problem: when to operate. If this question is answered in the book, it was not given a sufficiently prominent place. The volume is very attractively made, the printing and paper being of the best. It cannot be too strongly said that if this small and easily read book, which is much of the type and character of the writing of Sir Frederick Treves, were placed in the hands of every general practitioner of medicine, it would save hundreds of lives.

FIRST ANNUAL REPORT OF THE HENRY PHIPPS INSTITUTE FOR THE STUDY, TREATMENT AND PREVENTION OF TUBERCULOSIS. The Henry Phipps Institute, Philadelphia.

THE first annual report of this institute has a special interest in the fact that it *is* the first, and we can trace the development, gratifyingly rapid in this case, of its efficiency and magnitude. It is a well printed volume of 254 pages, and includes the lectures which have been delivered during the year under the auspices of the Institute by Dr. Trudeau, Dr. Osler, Dr. Biggs and Dr. Maragliano. The statistics are scientific rather than administrative, and give evidence that the threefold purpose of the Institute is being kept in mind in just proportion.

NEW METHODS OF TREATMENT. By Dr. LAUMONIER. Translated and edited by H. W. SYERS, M.A., M.D., Cantab. W. T. Keener & Co., Chicago.

THE author of this book has "endeavored" to quote his own words, "to furnish those interested in the subject of therapeutics with a definite and complete, and at the same time short and clear, information concerning the new drugs and methods of treatment whose worth has been established and which are sufficiently well known to be described in a definite and practical manner." The book certainly responds to a genuine need. The published formularies of the new remedies which appear from time to time do not always discriminate in accordance with a criterion of value, and sometimes fail to reach the men for whom this book is especially designed, the practitioner who meets the exacting demands of daily routine work with little time to investigate the new remedies and methods that multiply so rapidly. Special effort has been made in this work to include those methods of treatment which are not purely pharmacodynamic. It is to be regretted that the treatment of the subject-matter as a whole is somewhat fragmentary, but completeness in such a work is hard to arrive at, and the book may well prove a valuable aid to the practitioner.

BOOKS RECEIVED.

FIRST ANNUAL REPORT OF THE HENRY PHIPPS INSTITUTE. 8vo, 265 pages. Philadelphia.

ANEMIA IN PORTO RICO. Hon. B. Winthrop. 8vo, 150 pages. Government Printing Office, Porto Rico.

MANUAL OF OPERATIVE SURGERY. By Dr. J. F. Binnie. 12mo, 645 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

TRANSLATIONS OF THE AMERICAN RHINOLOGICAL ASSOCIATION. Twenty-sixth Annual Meeting. 8vo, 360 pages. Illustrated.

THE DISEASES OF SOCIETY. By Dr. G. F. Lydston. 8vo, 626 pages. Illustrated. J. B. Lippincott Co., Philadelphia and London.

TWENTIETH ANNUAL REPORT OF THE BUREAU OF ANIMAL INDUSTRY. 8vo, 618 pages. Illustrated. Government Printing Office, Washington.

A MANUAL OF GYNECOLOGY. By Drs. D. B. Hart and A. H. F. Barbour. Sixth edition. 8vo, 736 pages. Illustrated. W. T. Keener & Co., Chicago.

INTERNATIONAL CLINICS. Volume IV. Edited by Dr. A. O. J. Kelly. 8vo, 314 pages. Illustrated. J. B. Lippincott Co., Philadelphia and London.

AN ELEMENTARY TREATISE ON THE LIGHT TREATMENT FOR NURSES. By Dr. J. H. Sequeria. 12mo, 83 pages. Illustrated. The Scientific Press, London.

EXAMINATION OF THE URINE. By Dr. G. A. De Saxe. 12mo, 391 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

A MANUAL OF PERSONAL HYGIENE. By Dr. W. L. Pyle. 12mo, 441 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

A TEXT-BOOK OF INSANITY. By Dr. R. von Krafft-Ebing. Translated by Dr. C. E. Chaddock. 8vo, 638 pages. Illustrated. F. A. Davis Co., Philadelphia.

DIET IN HEALTH AND DISEASE. By Drs. J. Friedenwald and J. Ruhräh. 8 vo, 690 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

ESSENTIALS OF BACTERIOLOGY. By M. V. Ball. Edited by Dr. K. M. Vogel. 12mo, 243 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.